

GEOGRAPHIC VARIATION IN *ANOLIS DISTICHUS* COPE (LACERTILIA, IGUANIDAE) IN THE BAHAMA ISLANDS AND HISPANIOLA

ALBERT SCHWARTZ¹

ABSTRACT

Anolis distichus is widely distributed in the Bahama Islands and Hispaniola, including the Hispaniolan satellite islands of Ile-à-Vache, Grande and Petite Cayemite, Isla Catalina, and Isla Saona. Analysis of variation in head scutellation, body color and chromatic repertory, and dewlap pigmentation shows that *A. distichus* is divisible into the following subspecies: *A. d. distichus*—Bahama Islands: New Providence, Exuma Cays, Long Island, Ragged Islands; *A. d. distichoides*—Bahama Islands: Andros; *A. d. biminensis*—Bahama Islands: South Bimini; *A. d. dapsilis* new subsp.—Bahama Islands: Eleuthera; *A. d. ocior* new subsp.—Bahama Islands: Rum Cay and San Salvador. The status of the Cat Island populations is questionable. On Hispaniola, *A. distichus* has been divided into the following subspecies: *A. d. dominicensis*—most of Haiti and the northern half of the República Dominicana; *A. d. ignigularis*—central southeastern República Dominicana; *A. d. properus* new subsp.—extreme eastern República Dominicana; *A. d. sejunctus* new subsp.—Isla Saona; *A. d. tostus* new subsp.—Isla Catalina; *A. d. ravitergum* new subsp.—south central República Dominicana; *A. d. favillarum* new subsp.—Sierra de Baoruco in southwestern

República Dominicana; *A. d. aurifer* new subsp.—central portion of Tiburon Peninsula in southwestern Haiti; *A. d. vinosus* new subsp.—southwestern portion of Tiburon Peninsula; *A. d. suppar* new subsp.—extreme tip of Tiburon Peninsula; *A. d. patruclis* new subsp.—Ile Grande Cayemite. *A. d. floridanus* has been re-established as a valid name for the continental Florida populations which do not agree with their Bahaman relatives; it is suggested that *floridanus* is in actuality a Bahaman form from the western portion of Andros Island. An extensive history of *A. distichus* is presented to account for the distribution and variation in the species.

INTRODUCTION AND ACKNOWLEDGMENTS

Anolis distichus Cope is a rather small and stocky anoline lizard which occurs throughout the islands of the Great Bahama Bank, Rum Cay and San Salvador, on Hispaniola and some of its satellite islands, and in Florida. The species was first described in 1861 from New Providence Island in the Bahamas. In 1863, Reinhardt and Lütken named *Anolis dominicensis* from Hispaniola and, although recognizing the similarities between the two species, considered *dominicensis* specifically distinct from *distichus*. Barbour (1937) apparently first combined the two species (as *A. d. distichus* and *A. d. dominicensis*). This

¹ Dept. of Biology, Miami-Dade Junior College, Miami, Florida 33167.

combination was followed by Mertens (1939) and Cochran (1941); Mertens gave a thorough review of the subspecies of *A. distichus* which had been described in the 76 years between the naming of *A. dominicensis* and 1939. These subspecies include *altavelensis* Noble and Hassler (Isla Alto Velo off Cabo Beata, República Dominicana), *caudalis* Cochran (Ile de la Gonâve, Haiti), *juliae* Cochran (Ile-à-Vache, Haiti), and *wetmorei* Cochran (Isla Beata, República Dominicana), as well as *distichoïdes* Rosén (Andros Island, Bahama Islands). Mertens himself named two new subspecies from the República Dominicana (*ignigularis* and *albidogularis*) and resurrected *brevirostris* Bocourt as applicable to specimens from the vicinity of Barahona in the southwestern República Dominicana. Finally, Oliver (1948) described *A. d. biminicensis* from South Bimini Island in the western Bahamas and Smith and McCauley (1948) named *A. d. floridanus* from southern Florida. Thus, as presently understood, there are 12 subspecies of *A. distichus* recognized, of which three are Bahaman, eight occur on Hispaniola and its associated islets, and one is on the North American continent.

The present paper is a result of collections made by myself and parties in both the Bahama Islands and Hispaniola and of specimens and information gathered by Dr. Ernest E. Williams at the Museum of Comparative Zoology at Harvard University under grants from the National Science Foundation, B-16066 and GB-2444, and from the American Philosophical Society. Dr. Williams, who has for some time been involved with Hispaniolan anoles, recognized that some of the forms associated with *A. distichus* in actuality pertain to another (and similar) species, *A. brevirostris*. He suggested that he and I jointly work out the variation in *A. distichus* on Hispaniola as part of a rather extensive paper dealing with new data which have accumulated concerning these lizards on that island. But because of other duties, Dr.

Williams has agreed to a partition of the larger work and has also suggested that I summarize the new information on *A. distichus* by myself. His collections of anoles made in Haiti and my own collections from the República Dominicana supplement one another very nicely, so that a more or less complete picture of the situation of *A. distichus* on the entire island of Hispaniola is now much more possible than heretofore. There are still certain gaps in our knowledge, and these will be pointed out in their proper places.

Most specimens which I have examined are in the Albert Schwartz Field Series (ASFS); a more limited amount of material has been borrowed from the American Museum of Natural History (AMNH), Carnegie Museum (CM), Field Museum of Natural History (FMNH), Museum of Comparative Zoology (MCZ), Richard Thomas (RT), University of Florida, Florida State Museum (UF FSM), Museum of Zoology, University of Michigan (UMMZ), and United States National Museum (USNM). I am grateful to the following curators and their assistants for the loan of this supplemental material: Charles M. Bogert and George W. Foley, Neil D. Richmond, Robert W. Inger and Hymen Marx, Ernest E. Williams, Wayne King, Charles F. Walker, Doris M. Cochran and James A. Peters. Paratypes of new subspecies have also been deposited in the Academy of Natural Sciences of Philadelphia (ANSP), Museum of Natural History, University of Kansas (KU), and the University of Illinois Museum of Natural History (UIMNH). Since coloration and pattern play such a major role in differentiating the various subspecies of *A. distichus*, I have not considered it worthwhile to borrow all the available specimens of the species which exist in collections. Many of these older specimens are long preserved and now much faded. I have attempted to examine all material which might be assignable to new taxa proposed herein, and have examined all specimens which are designated

as paratypes. Lists of referred specimens in several cases include localities and museum numbers (MCZ) which I assign to certain taxa on the basis of provenance; specimens so listed have not been examined by myself. ASFS specimens have of course been studied in detail. The probability is high that almost all lizards listed as referred specimens are correctly designated sub-specifically, since they have come from areas whose borders are delimited by fresh material which I have examined. Exceptional instances or uncertain allocations are noted in the text.

In the field I have had the capable assistance of Patricia A. Heinlein, Ronald F. Klinikowski, David C. Leber, Dennis R. Paulson, and Richard Thomas. Mr. Thomas succeeded in securing two distinctive subspecies of *A. distichus* on Isla Saona and Ile Grande Cayemite for me, and Messrs. Paulson and C. Rhea Warren made especial efforts to secure these lizards when they visited Cat Island, San Salvador, and Long Island on my behalf. Mr. Warren has also donated specimens collected by himself on South Bimini Island and in southern Florida. Carefully taken color notes from living specimens have been indispensable, and frankly, without them, the variational picture of *A. distichus* throughout its range would be impossible to interpret; I therefore wish to commend the efforts of others in this particular matter of information on fresh material, without which parts of the present paper would be in doubt.

I am particularly in the debt of David C. Leber, whose water color portraits of the various subspecies of *Anolis distichus* aid greatly in the visualization of the color differences in these lizards. Plates I and II are the result of Mr. Leber's work.² Of the 16 portraits, ten were executed in the field, often under trying circumstances; the remaining six were rendered from freshly preserved specimens and extensive color

notes, at times additionally accompanied by Kodachrome transparencies. These latter portraits, completed under the critical eyes of myself and Richard Thomas (whose field notes are herewith gratefully acknowledged), are as accurate as those done in the field.

HISTORICAL SUMMARY

As noted in the introduction, there are 12 subspecies of *A. distichus*. However, these subspecies in actuality represent two species, whose prior names are *A. distichus* Cope and *A. brevirostris* Bocourt. Variation in the latter species, as well as its ecological interrelationships with *A. distichus*, are presently under study by Dr. Williams and need not concern us further here. In general, the two species are allotopic but broadly sympatric, although *A. distichus* is much more widely spread on Hispaniola than is *A. brevirostris*. In certain regions, however, the two species are precisely syntopic; in the most general terms, *A. brevirostris* inhabits xeric regions and *A. distichus* more mesic situations, but there are obvious and bold exceptions to this statement (for example, *A. distichus* on extremely hot and dry Isla Catalina off the southern Dominican coast).

The named forms which are correctly associated with *A. brevirostris* are *caudalis* Cochran and *wetmorei* Cochran, whereas the balance of the subspecies (*dominicensis*, *ignigularis*, *albidogularis*, *juliae*, *distichoides*, *biminiensis*, *floridanus*) are correctly associated with *A. distichus*. The most trenchant scale difference between the two species is the absence of a "preoccipital" scale in *A. brevirostris* and its presence in *A. distichus*. Even this character is not constant in either species, since most specimens of *A. distichus* from South Bimini and many from Andros lack the "preoccipital" (primarily by fusion with the interparietal), and occasional specimens from other Bahaman Islands (most commonly from Eleuthera) lack the "preoccipital" either by fusion with the interparietal or by frag-

² Publication of these plates has been made possible by N.S.F. grant GB-6944 to Ernest E. Williams.

mentation. Twenty-three *A. distichus* of a total of 1001 examined from Hispaniola and its satellites lack the "preoccipital," primarily by fragmentation (thus the area usually occupied by the "preoccipital" is crowded by a number of small scales) or by fusion with the interparietal—the latter being the less common condition. Of these 23 aberrant Hispaniolan *A. distichus*, none is from regions where *A. distichus* and *A. brevirostris* are sympatric, but three are from areas where *A. brevirostris* might be expected to occur (Llanos de Azua).

I have made no attempt to examine large series of *A. brevirostris* but have studied 46 specimens of this species from the Département de l'Ouest in Haiti (localities include the northern shore of the Golfe de la Gonâve, the Cul de Sac Plain and the southern coast in the Jacmel area) and the vicinities of Barahona and San Juan in the República Dominicana. In this lot of material, I find that the "preoccipital" is very variable in occurrence and shows an amount of variation equal to that in *A. distichus*. The scale is most often absent (fused or fragmented) in lizards from the Barahona area in the República Dominicana, but in Haitian material it is more often present, although at times tiny or small in size. The amount of overlap in size of the "preoccipital" in *A. distichus* and *A. brevirostris* is fairly broad, and there are many specimens of the latter that have a "preoccipital" as large as that of many specimens of the former. I do not interpret this condition as intergradation or hybridization, but as part of the variation of each species. There are pattern differences between the two species, since *A. brevirostris* has a pair of black nuchal spots, which is absent in *A. distichus*; no *A. brevirostris* ever assumes a green color, as do many subspecies of Hispaniolan *A. distichus*. As far as my observations are concerned, *A. brevirostris* is the smaller lizard, reaching a maximum snout-vent length in males of 47 mm, whereas *A. distichus* is generally larger, with the largest males of all races repre-

sented by large numbers having snout-vent lengths between 48 and 58 mm.

One name, *altavelensis*, has not been associated with either *A. distichus* or *A. brevirostris*. This form resembles *A. distichus* in having a "preoccipital," but, because of other differences, Dr. Williams suggests that it not be associated with this species and that it be considered as a species distinct from either *A. distichus* or *A. brevirostris*. The fauna of Isla Alto Velo presents consistent peculiarities when compared with that of adjacent Isla Beata and the Península de Barahona, and specific status for *A. altavelensis* is no exception, since both Isla Beata and the Península de Barahona south of the Sierra de Baoruco are inhabited solely by *A. brevirostris*. Thus *altavelensis*, with its "preoccipital," is unexpectedly like *A. distichus* (which occurs in this region exclusively in the Sierra de Baoruco and the eastern Massif de la Selle, and not in the lowlands or along the coast) rather than like *A. brevirostris*. Doubtless *A. altavelensis* has had a long independent history from the balance of *A. distichus*; a similar situation occurs in the Alto Velo *Leiocephalus* (which I have regarded as a peculiarly disjunct subspecies of the geographically removed *L. vinculum*; Schwartz, 1967).

The material on which the name *A. dominicensis* was based had as its provenance merely "Haiti"; Dr. Williams has examined the syntypes and assures me that they are indeed identical with those lizards which are currently called *A. d. dominicensis*, and not with *A. brevirostris*. With the description of several new mainland Hispaniolan subspecies of *A. distichus*, it is appropriate to restrict the type locality of *A. d. dominicensis* in order to clarify my concepts of that subspecies. I hereby designate Port-au-Prince, Département de l'Ouest, Haiti, as the type locality of *A. d. dominicensis*. It is not unlikely that the original specimens, collected by A. H. Riise, did indeed come from the vicinity of the capital of Haiti; Port-au-Prince has long

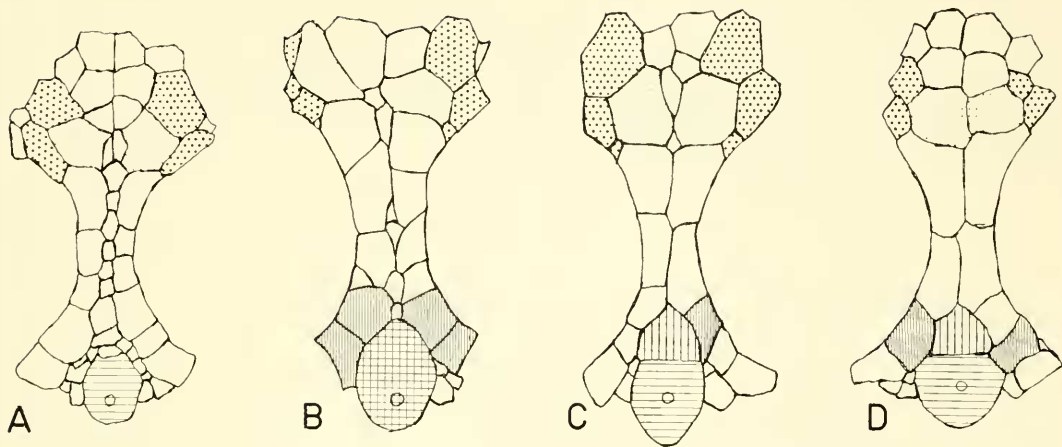


Figure 1. Partial dorsal views of heads of *Anolis distichus* showing modifications of head scales. Symbols: interparietal, widely spaced horizontal lines; "preoccipital," widely spaced vertical lines; supraorbitals in contact with interparietal, narrow vertical lines; median azygous head scales, dense stipple; postfrontals, open stipple; scales in lateral contact with postfrontals, heavy stipple.

A) ASFS 10283, Andros Island, Bahama Islands; 2/2 scales in lateral contact with postfrontals; supraorbital semicircles completely separated by a series of 10 median azygous head scales; "preoccipital" absent by fragmentation; 0/0 supraorbitals in contact with interparietal.

B) ASFS X4709, South Bimini Island, Bahama Islands; 3 scales in lateral contact with postfrontal on right side, left side abnormal; supraorbital semicircles in contact; 6 median azygous head scales; "preoccipital" absent by fusion with interparietal (denoted by overlap of symbols); 2/2 supraorbitals in contact with interparietal.

C) KU 93369, Carrefour Canon, Haiti; 3/3 scales in lateral contact with postfrontals; supraorbital semicircles in contact; 4 median azygous head scales, including "preoccipital" (denoted by shading); "preoccipital" present; 0/1 supraorbitals in contact with interparietal.

D) USNM 157924, 10 km W Bani, República Dominicana; 2/2 scales in lateral contact with postfrontals; supraorbital semicircles in contact; one (the "preoccipital," denoted by shading) median azygous head scale; "preoccipital" present; 1/1 supraorbitals in contact with interparietal.

been a prominent Caribbean seaport. Another possibility might be Cap-Haïtien, and assumption of this city as the source of the original *dominicensis* material would not alter my taxonomic conclusions, since I regard the populations of *A. distichus* at Cap-Haïtien as identical with those at Port-au-Prince. In favor of Port-au-Prince as the type locality of *dominicensis* is the (admittedly oblique) association of Riise with the type specimen of *Sphaerodactylus copei* Steindachner, a lizard which does occur in the environs of Port-au-Prince but not at Cap-Haïtien (see Schwartz and Thomas, 1965:317, for discussion of *S. copei*).

METHODS

When he described *A. d. biminiensis*, Oliver (1948) analyzed some Bahaman

populations of *A. distichus* on the basis of various scale counts and relationships. Hoping that an application of his counts to non-Bahaman *A. distichus* might reveal differences other than coloration and pattern between various subspecies, I have followed his techniques and applied them to the material I have examined. Representations of several of the variant conditions are shown in Figure 1. The scale counts employed are:

1) Number of scales across the snout at the level of the second canthal scale. I follow Williams (1962:2) in making this count, in that the second canthal is reckoned from the anterior border of the orbit.

2) Number of loreal rows.

3) Scales between the supraorbital semicircles.

TABLE 1. SIXTEEN SUBSPECIES OF *Anolis distichus*, SHOWING STATISTICALLY SIGNIFICANT DIFFERENCES IN MEANS OF NUMBER OF MEDIAN AZYGOUS HEAD SCALES. SIZE OF SAMPLE IN FIRST COLUMN, MEANS AND TWO STANDARD ERRORS OF MEANS IN SECOND COLUMN. A PLUS IN TABLES INDICATES THAT THE TWO SUBSPECIES INVOLVED DIFFER SIGNIFICANTLY (NON-OVERLAP OF TWO STANDARD ERRORS OF MEAN); A MINUS INDICATES NO STATISTICAL DIFFERENCES. TWO SUBSPECIES (*sejunctus*, *lostus*) ARE NOT INCLUDED BECAUSE OF VERY SMALL SAMPLE SIZE.

	N	M	<i>distichus</i>	<i>distichoides</i>	<i>biminiensis</i>	<i>dapsilis</i>	<i>ocior</i>	<i>dominicensis</i>	<i>ignigularis</i>	<i>properus</i>	<i>ravitergum</i>	<i>facillarum</i>	<i>aurifer</i>	<i>vinosus</i>	<i>juliae</i>	<i>suppar</i>	<i>patruelis</i>	<i>floridanus</i>
<i>distichus</i>	126	6.0 ± .23	X	+	—	—	—	+	+	+	+	+	+	+	+	+	+	+
<i>distichoides</i>	160	8.7 ± .16		X	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>biminiensis</i>	42	5.5 ± .78			X	—	—	+	+	+	+	+	+	+	+	+	—	+
<i>dapsilis</i>	101	6.2 ± .36				X	—	+	+	+	+	+	+	+	+	+	+	+
<i>ocior</i>	55	5.8 ± .49					X	+	+	+	+	+	+	+	+	+	+	+
<i>dominicensis</i>	235	3.9 ± .20						X	+	+	+	—	—	+	—	+	—	+
<i>ignigularis</i>	106	3.5 ± .08							X	+	+	—	—	—	—	—	+	+
<i>properus</i>	58	2.8 ± .16								X	—	+	+	+	—	+	+	+
<i>ravitergum</i>	49	2.6 ± .33									X	+	+	+	+	+	+	+
<i>facillarum</i>	26	3.8 ± .48										X	—	—	—	—	—	+
<i>aurifer</i>	64	3.7 ± .32											X	—	—	—	+	+
<i>vinosus</i>	100	3.4 ± .26												X	—	—	+	+
<i>juliae</i>	27	3.4 ± .46													X	—	+	+
<i>suppar</i>	174	3.4 ± .19														X	+	+
<i>patruelis</i>	25	4.6 ± .62															X	+
<i>floridanus</i>	90	7.9 ± .30																X

4) Number of rows of scales between supraorbital semicircles and interparietal scale. This figure is written as a fraction (i.e., 1/1, meaning that the interparietal is separated from the semicircles by one scale on each side). A count of 0.0 means that there are no scales between the semicircles and the interparietal, and that the semicircles and interparietal are thus in contact.

5) Number of subdigital lamellae on phalanges II and III of the fourth toe.

6) Number of scales bordering the postfrontal laterally (see Oliver, 1948:16, for drawings showing these scales in *A. distichus*). In a small number of specimens of *A. distichus*, the postfrontal may abnormally extend so far laterally as to make contact with one of the canthals. In such instances, I have not included the canthal as a scale in contact with the postfrontal, since the condition is obviously anomalous.

7) Number of median (usually azygous) scales posterior to the posteriormost para-

median pair of snout scales, usually restricted to the midline from the anterior border of the prefrontals posteriorly, and including the "preoccipital" as an unpaired median scale. Thus a count of 1, for example, means that between the anterior border of the postfrontals and the interparietal, there is only one scale (usually the "preoccipital"). A count of 0 occurs when the "preoccipital" is fused with the interparietal, provided that there are no additional median azygous scales. If some or all of the scales between the postfrontals are paired, but extremely irregularly so, the count includes these irregularly paired scales as median azygous scales, since they do not present the regular conformation of the paired paramedian snout scales of *A. distichus*. Table 1 shows the statistical significance of differences between subspecies in this character.

8) Number of supraorbital semicircle scales in contact with interparietal. This count is partly correlated with (4), the

TABLE 2. SIXTEEN SUBSPECIES OF *Anolis distichus*, SHOWING STATISTICALLY SIGNIFICANT DIFFERENCES IN MEANS OF NUMBER OF POSTMENTAL SCALES. SEE TABLE 1 FOR DETAILS.

	N	M	<i>distichus</i>	<i>distichoïdes</i>	<i>biminiensis</i>	<i>dapsilis</i>	<i>ocior</i>	<i>dominicensis</i>	<i>ignigularis</i>	<i>properus</i>	<i>ravitergum</i>	<i>favillarum</i>	<i>aurifer</i>	<i>vinosus</i>	<i>juliae</i>	<i>suppar</i>	<i>patruelis</i>	<i>floridanus</i>
<i>distichus</i>	127	5.5 ± .22	X	+	+	—	+	+	+	+	—	+	+	+	+	+	+	+
<i>distichoïdes</i>	159	4.6 ± .14		X	—	+	+	+	+	+	+	+	+	+	+	+	+	—
<i>biminiensis</i>	42	4.8 ± .20			X	+	+	+	+	+	+	+	+	+	+	+	+	—
<i>dapsilis</i>	105	5.2 ± .21				X	+	+	+	+	—	+	+	+	+	+	+	+
<i>ocior</i>	56	6.7 ± .28					X	—	+	—	—	—	—	—	—	—	—	+
<i>dominicensis</i>	240	6.6 ± .13						X	+	—	+	—	+	+	+	+	+	+
<i>ignigularis</i>	105	6.0 ± .29							X	+	—	—	+	+	+	+	+	+
<i>properus</i>	58	6.7 ± .38								X	+	—	—	+	+	+	+	+
<i>ravitergum</i>	56	5.6 ± .34									X	—	+	+	+	+	+	+
<i>favillarum</i>	28	6.1 ± .41										X	+	+	+	+	+	+
<i>aurifer</i>	62	7.2 ± .28											X	—	—	—	—	+
<i>vinosus</i>	98	7.4 ± .27												X	—	—	—	+
<i>juliae</i>	31	7.2 ± .47													X	+	—	+
<i>suppar</i>	171	7.9 ± .22														X	—	+
<i>patruelis</i>	25	7.8 ± .48															X	+
<i>floridanus</i>	89	4.4 ± .23																X

number of rows of scales between the semicircles and the interparietal; for instance, if the latter count is 1/1, the number of supraorbital scales in contact with the interparietal will of necessity be 0/0. However, if the count of (4) is 0/0 (i.e., there are no scales between the semicircles and the interparietals), then (8) may have a fairly wide fluctuation.

9) Number of postmental scales. Table 2 shows the statistical significance of differences between subspecies in this character.

10) Presence or absence of a "preoccipital."

The above counts have been taken on 1588 specimens from Florida, the Bahamas, and Hispaniola. Some of them have proved to be useful, primarily on a modal rather than an absolute level, in defining the subspecies. Very small samples often show such a wide diversity in some counts that it is impossible to state with certainty what the modal condition is, but with increasingly large samples, in most cases a distinct mode can be easily determined for each of the counts. The degree of overlap between the various counts for the different samples

is often great, so that it is difficult to identify a particular lizard to subspecies on the basis of any single count. Reliance must be placed on such features as dewlap pattern and coloration, and coloration and pattern of the head and body.

Of the counts taken, those of scales across the snout, number of loreal rows, and lamellae overlap so broadly between the samples and are so variable *intra se* that they serve no useful purpose insofar as diagnosing the subspecies is concerned. The data for these counts are presented in each case, but merely for the sake of completeness.

BAHAMAN VERSUS HISPANIOLAN POPULATIONS AS A WHOLE

The only statement contrasting the differences (if any) between all the Bahaman populations of *A. distichus* versus all the Hispaniolan populations is that of Cochran (1941:146) who noted that "In adult examples of *distichus* there are distinct keels on the enlarged scales of the femur, while in *dominicensis* these scales are always smooth. . . ." Examination of large num-

bers of *A. distichus* indicates that no such dichotomy exists, and the two major geographic subdivisions cannot be distinguished on the basis of presence or absence of keeled scales on the anterior femoral face. Additionally, no other scale character will separate the two segments of *A. distichus* absolutely, but there are a few characters which generally differentiate the two sections.

1) There is a tendency for Bahaman populations to have the supraocular semicircles completely separated by a single median row of zygous head scales. This character reaches its greatest development in the populations from South Bimini and Andros in the Bahamas, but occurs casually in all other Bahaman samples. No Hispaniolan specimen shows this character.

2) All Bahaman populations but one have 0/0 scales between the semicircles and the interparietal as the modal condition, whereas in Hispaniolan samples there are either 0/0 or 1/1 scales modally between the semicircles and the interparietal, with 1/1 having the higher incidence by population.

3) Median head scales in the Bahamas vary in mean from 5.5 to 8.7, whereas in Hispaniola the means vary from 2.6 to 5.0—the highest mean being probably higher than it is in reality, since the sample is composed of only six lizards. Table 1 shows the data on head scales.

4) The absence of the "preoccipital" scale is most frequently encountered in Bahaman populations and occurs only very rarely in Hispaniolan *A. distichus*, as previously pointed out. All Bahaman populations from which I have examined samples have at least one or a few specimens which lack the "preoccipital" scale, whereas only a very few Hispaniolan *A. distichus* lack this feature.

Although none of the above is completely diagnostic of Bahaman versus Hispaniolan *A. distichus*, it does suggest that there has been a greater divergence between the two major segments of *A.*

distichus than between intra-Bahaman and intra-Hispaniolan populations.

There is also one suggestive color difference between Bahaman and Hispaniolan *A. distichus*. With one exception, all Bahaman populations are incapable of a true green phase. The general coloration of Bahaman lizards is a pale ashy gray to sandy tan, capable of becoming dark wood brown, although this latter condition is rather rarely observed. Very occasionally Bahaman lizards are observed to be a very pale ashy green, but bright or dark green lizards, such as occur in several Hispaniolan populations, are unknown from the Bahamas. The one Bahaman exception is lizards from Rum Cay and San Salvador; on these two isolated islands, *A. distichus* is distinctively colored (in reference both to other Bahaman and to Hispaniolan populations) in that it is regularly a pea-green or yellow-green. In fact, the yellow component of the dorsal pigmentation may be more striking than the green hues. The Rum Cay-San Salvador lizards are the only populations in the Bahamas where *A. distichus* is known to be greenish rather than gray or tan.

Many Hispaniolan subspecies of *A. distichus*, on the other hand, do indeed have a green phase, the greens varying from bright to a pale ashy (which is much more distinctly green than any green observed in Bahaman lizards other than those on Rum Cay and San Salvador). Even this color repertory distinction between the two segments of *A. distichus* is not absolute, since some Hispaniolan subspecies are not known to be able to assume the green phase, and thus resemble the Bahaman populations.

As far as dewlap coloration and pattern are concerned, the Bahaman *A. distichus* are very like some of their Hispaniolan relatives. Although I have no quantitative data, the dewlaps of Bahaman *A. distichus* appear smaller than do those of the Hispaniolan lizards, but this may be merely an artifact of observation or preservation techniques. The dewlap pattern and coloration of Bahaman *A. distichus* resemble those

of lizards from various Hispaniolan localities; the most aberrant dewlap pattern and colors occur in specimens from the extreme southwestern portion of the Tiburon Peninsula of Haiti and on its adjacent Ile-à-Vache.

SIZE AND NATURAL HISTORY

The largest specimens of *A. distichus* are from the southeastern uplands of Haiti. On the Montagne Noire in the vicinity of Peneau and Furcy, males reach a snout-vent length of 58 mm and females 48 mm. In general, in all populations, females reach a maximum size of about one centimeter less than males. The smallest of the maximally sized males (46 mm snout-vent length) are from Isla Catalina off the southern coast of the República Dominicana, and the smallest maximally sized female (38 mm) is from Isla Saona. However, the samples from both islands are very small (five males and one female from Saona; three males from Catalina), so that these comments are equivocal.

Etheridge (1966:351) stated that the largest Bahaman *A. distichus* he had examined had snout-vent lengths of 48 mm (New Providence, Andros, Cat) to 53 mm (Eleuthera). On the other hand, he noted that Hispaniolan specimens reached a maximum snout-vent length of about 50 mm. My own Bahaman data, based on 385 specimens in contrast to Etheridge's data for 126 specimens, do not agree with his Bahaman figures, since the maximally sized Eleuthera male (of 107 Eleuthera specimens) I have measured has a snout-vent length of 50 mm, slightly smaller than Etheridge's maximum for that island. The largest Bahaman males I have seen are from San Salvador and Rum Cay, and have snout-vent lengths of 53 mm, precisely the same as the largest male (from Eleuthera) examined by Etheridge. These discrepancies have little significance, but they indicate that populations on various Bahaman Islands do differ in maximum adult size.

A. distichus has a broad distribution on Hispaniola and is rivalled in this respect only by *Anolis ricordi* Duméril and Bibron, *Anolis cybotes* Cope, and *Anolis semilineatus* Cope. It occupies situations varying from mesic oases in otherwise extremely xeric regions (Cul de Sac-Valle de Neiba plain) to rain forest at high elevations; it even occurs in only slightly more shady areas within xeric areas themselves (vicinity of Monte Cristi, República Dominicana). Typically, *A. distichus* prefers shady and mesic forested or pseudo-forested situations, such as hardwood forests, coffee and cacao groves, mango-breadfruit-royal palm associations, overgrown and shady fence-rows along abandoned fields, etc. In some areas it literally swarms, whereas in other and apparently quite similar areas it is extremely uncommon. *A. distichus*, in dense forest, often prefers large trees which extend above the lower canopy, and in cacao groves (where *A. distichus* and *A. cybotes* occur syntopically on the same trees), *A. distichus* in general seems to prefer the more exposed—and thus slightly more sunny—branches, although a mature cacao grove is inherently very deeply shaded and cool and often canopied by much larger forest trees. Sleeping *A. distichus* are not easily observed, as Rand (1962:11) pointed out. I saw none in Haiti in two months' fieldwork, and encountered the first sleeping individual near Miches in the República Dominicana; this lizard was on the upper surface of an herb leaf within two feet of the ground. In northwestern República Dominicana, near Palo Verde, in an extensive patch of flood plain hardwoods along the Río Yaque del Norte, Thomas and I encountered many *A. distichus* sleeping in company with *A. cybotes* and *A. chlorocyanus* Duméril and Bibron. Here *A. distichus* customarily slept on the leaves and twigs of small herbs and shrubs, within three feet of the ground, whereas both *A. cybotes* and *A. chlorocyanus* slept on the tips of small branches of saplings or on the tips of long and slender lianas and vines.

A. chlorocyanus slept distinctly higher in the canopy than *A. cybotes*, since no *A. chlorocyanus* was encountered below eight feet above the ground and most were above ten feet and inaccessible. Considering the occurrence at this locality of the vine-inhabiting and climbing snakes *Epicrates gracilis* Fischer and *Uromacer oxyrhynchus* Duméril and Bibron, the use of the tips of branches and pendant vines by *A. cybotes* and *A. chlorocyanus* is most suggestive; the distinctly lower and non-tree or vine associated sleeping sites for *A. distichus* may well have a distinct positive survival value in an area where these two primarily arboreal snakes are abundant.

A. distichus occurs in Hispaniola at elevations from below or near sea level (Valle de Neiba) to at least 6000 feet (1830 meters), in the Sierra de Baoruco, Massif de la Selle, and Cordillera Central.

In the Bahamas, *A. distichus* occurs with some frequency in hammock woods or coppice (South Bimini, New Providence), but also occupies (as Rand, 1962:4, noted for Hispaniolan *A. distichus*) isolated large and often gray-barked trees, such as *Ficus*, with whose bark coloration the Bahaman races blend excellently, and which additionally offer sanctuary among adventitious roots and buttresses. Other trees with which *A. distichus* is customarily associated in the Bahamas are *Coccoloba*, *Lysiloma*, and *Terminalia*; all have pale bark which renders the lizards inconspicuous. In Nassau, *A. distichus* occurs commonly on crannied limestone walls and street cutbanks, and on San Salvador the species was abundant about the ruins of Sandy Point House (= Watling's Castle), both on the surrounding trees and saplings and on the building itself.

On some Bahaman islands, *A. distichus* is quite common. Thus, it is abundant on New Providence and Eleuthera, for instance, and Oliver (1948:32) noted that C. M. Breder, Jr., secured a series of 164 *A. distichus* from native boys on Andros; my own observations on Andros do not

indicate such a present abundance of *A. distichus*, however. On South Bimini, *A. distichus* is only moderately common; Oliver (*op. cit.*:22) secured 20 specimens from *Ficus* and *Coccoloba*, but recent collectors have not secured these lizards so abundantly on South Bimini. At the other extreme of abundance lies Rum Cay, where *A. distichus* is distinctly uncommon; here the lizards were observed and collected primarily on *Cocos* palms and other trees in the settlement of Port Nelson, and only occasional individuals were observed away from human habitations. Only two individuals, both on Cat Island, have been noted sleeping in the Bahama Islands. Richard Thomas observed these lizards sleeping on small limbs, between 6 and 7 feet (± 2 meters) above the ground; one sleeping lizard was in a *Sabal* grove and the other in an open group of large trees surrounded by thorn scrub. Occasional individuals have been collected diurnally beneath rocks both inland and near the strand, so it is possible that Bahaman *A. distichus* resort also to such situations for nocturnal retreats.

Rand (1962) has summarized his observations on three Hispaniolan anoles (*A. distichus*, *A. cybotes*, *A. chlorocyanus*) both in the field in the República Dominicana and in the laboratory. My observations on *A. distichus* differ somewhat from his; for instance, he regarded this species as living "primarily on isolated trees and fence posts and along the edges of woods and trails in open woods." The abundance of *A. distichus* in Dominican cacao groves (admittedly an artificial situation) and in dense mesic woods high in the Cordillera Central is in contrast to Rand's statement. Such differences may well reflect different habits in different regions, and suggest that one species of anole may occupy varying habitats in different areas, and that extreme caution should be used in generalizing about the habitat preferences of geographically widely distributed anoles. It is also pertinent in this connection that Mertens (1939:15) reported the occurrence of *A.*

distichus (along with *A. cybotes*) in pine forest at Paso Bajito in the Cordillera Central. In the higher pine woods near Constanza, at elevations between about 4000 and 6000 feet (1220 and 1830 meters), *A. distichus* is at best rather rare, preferring in this region residual stands of rainforest. It has not been taken or observed in the vicinity of Valle Nuevo (about 8000 feet; 2440 meters) where *A. shrevei* Cochran is the commonest (and perhaps only) anole of the cool and open pine-forested slopes.

SYSTEMATIC ACCOUNT

Anolis distichus distichus Cope

Anolis distichus Cope, 1861, Proc. Acad. Nat. Sci. Philadelphia:208.

Type locality: New Providence Island, Bahama Islands.

Definition: A subspecies of *A. distichus* characterized by small size (males to 49 mm, females to 44 mm snout-vent length), dorsum pale ashy gray to sandy tan and without a green phase, dewlap pale yellow, rarely with a vague basal to more extensive orange blush, modally 0/0 scales between the supraorbital semicircles and the interparietal, 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and high mean number (6.0) of median zygous head scales.

Distribution: The Bahama Islands: known definitely from New Providence, the Exuma Cays (Warderick Wells Cay, Staniel [= Stanyard] Cay, Darby Cay), Great Exuma, Little Exuma, Long Island, and Great Ragged Island (Fig. 2).

Comments: *A. d. distichus* is widely distributed on the islands to the east of the Tongue of the Ocean on the Great Bahama Bank and presumably on the Ragged Islands. Specimens from Cat Island will be discussed later.

In life, *A. d. distichus* is normally a gray lizard, but some specimens are sandy tan in life. Occasional specimens demonstrate a boldly contrasting pattern of brownish black

ground color with black crossbands; in this phase the snout is smudged with sooty black and the eyeskin is also sooty. Rarely some lizards show a very pale greenish gray phase. Although I have not so recorded it, I assume that *A. d. distichus* can become rich dark brown as can several of the other Bahaman subspecies. The dorsum is at best only very weakly longitudinally striate with darker, and there may be a single vague scapular chevron, its apex pointed posteriorly. The interocular dark bar is variable, but even when best expressed, is not especially prominent; other head markings are vague and ill defined. The venter is cream to very pale yellowish, and the underside of the tail is very pale yellow also. The dewlap is regularly pale yellow (Pl. 1). Rarely is there a basal orange blush; if present, the orange is extremely faint and only barely discernible. Very occasional specimens (Long Island) have the pale orange more extensive.

The islands to which I have attributed the nominate subspecies may be conveniently divided for further discussion into four areas: 1) New Providence, 2) the Exuma Cays, including Great and Little Exuma, 3) Long Island, and 4) Great Ragged Island. The samples from these four areas are alike in dorsal coloration and pattern and presumably in dewlap color (I have not seen live Ragged Island specimens), and on these bases I group them together. In scale characters, there are some differences which may be pertinent, but I have chosen not to emphasize them. The following data are from a series of 49 New Providence specimens, 16 from the Exumas, 57 from Long Island, and 10 from Great Ragged Island. I have seen living specimens from New Providence and Long Island, and freshly preserved material from the Exumas.

Long Island and Great Ragged Island specimens modally have 0/0 scales between the semicircles and the interparietal, and 0-0 is one of two bimodes (each with 20 specimens) on New Providence. In the

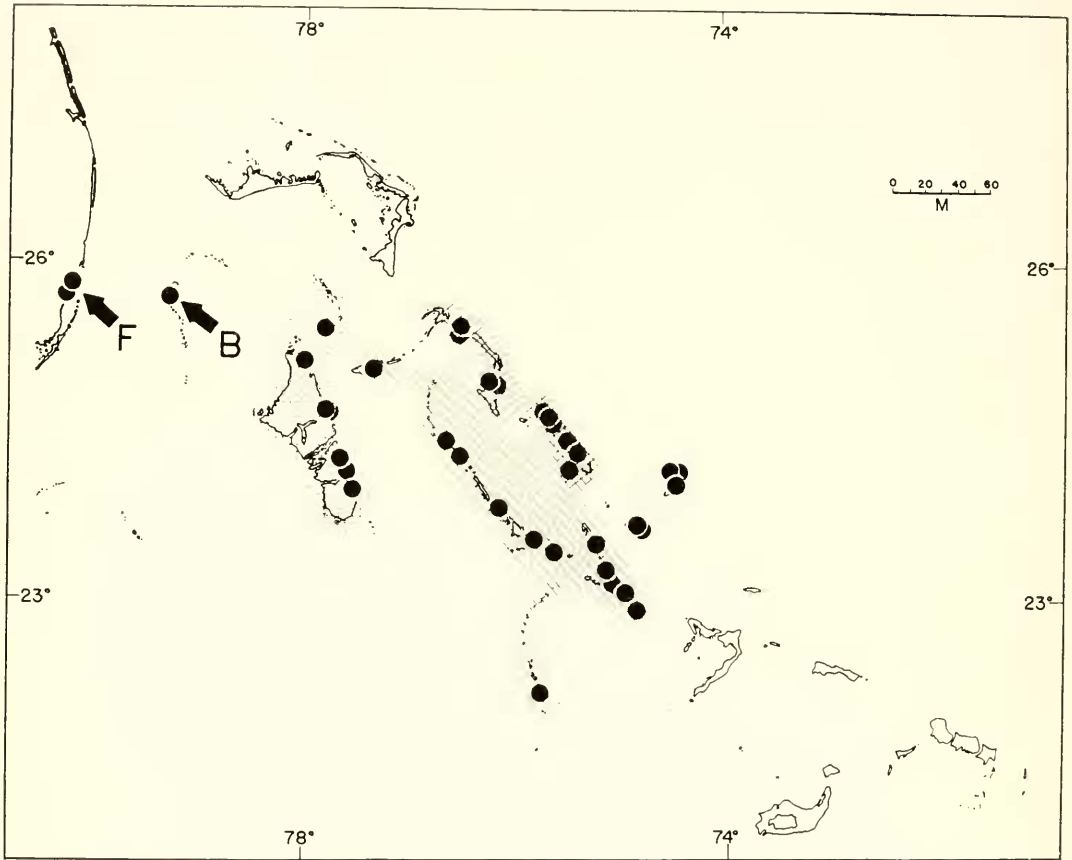


Figure 2. Map of the Bahama Islands, showing distribution of the subspecies of *Anolis distichus*; diagonal lines, upper left to lower right, *A. d. distichus*; diagonal lines, upper right to lower left, *A. d. dapsilis*; open stippling, *A. d. distichoides*; close stippling, *A. d. aciar*; F, *A. d. floridanus*; B, *A. d. biminiensis*; overlap of symbols for *A. d. distichus* and *A. d. dapsilis* suggests area of intergradation between these two subspecies.

specimens from the Exuma Cays, there are modally 1/1 scales between the semicircles and the interparietal. In number of supra-orbitals in contact with the interparietal, 0/0 is the mode in all samples except that from Great Ragged, which has 1/1 modally (although 0/0 has a frequency of two lizards and 1/1 a frequency of three lizards). All samples modally have 2/2 scales in lateral contact with the postfrontals. The highest incidence of complete median separation of the supraorbital semicircles occurs on Long Island (four of 53 lizards), whereas New Providence has three of 46, the Exumas one of 16, and none occurs on Great Ragged. Scales across the snout

range from 4 to 6 (New Providence), 8 (Exumas), or 7 (Long), and are either 5 or 6 on Great Ragged; modes 4 (New Providence), 5 (Great Ragged) and 6 (Exuma Cays, Long). Loreal rows vary from 3 to 5 on New Providence (mode 4), and 4 to 6 on the Exumas (mode 4) and Long (mode 5); loreal rows on Great Ragged are 4 or 5 (mode 4). Fourth toe lamellae vary from 15 to 20 (New Providence, the Exumas), 14 to 19 (Long), and 15 to 19 (Great Ragged), with modes of 18 in the former two samples and in the Great Ragged lizards, and 17 on Long Island. Median azygous head scales vary between 3 and 13 (mode 5, mean 6.2) on

New Providence, 3 and 9 (mode 5, mean 5.6) on the Exumas, 2 and 10 (mode 6, mean 5.9) on Long, and 3 and 10 (mode 6, mean 5.9) on Great Ragged. Postmentals vary from a low of 4 in all samples to 7 on New Providence, the Exumas, and Great Ragged, and 10 on Long. The mode is 4 on New Providence and the Exumas, and 6 on Long and Great Ragged. The means of postmentals are 5.0 (New Providence), 5.1 (Exumas), 5.4 (Long), and 5.3 (Great Ragged). The "preoccipital" is regularly present; one specimen from New Providence, one from the Exumas, one from Great Ragged, and four from Long lack this scale.

From the above data, it appears that a certain amount of divergence has taken place in the four areas which are inhabited by *A. d. distichus*. In general, the Exuma Cays material is closer in most counts to the lizards from New Providence (although the scales between the semicircles and the interparietal are a notable exception). The Long Island lizards, on the other hand, differ somewhat more. The sample from Great Ragged Island is too small for detailed comment. In the absence of any established chromatic or pattern differences, I place all four populations in the nominate subspecies, although I acknowledge the modal differences mentioned.

As noted above, *A. d. distichus* is common on New Providence, where it was observed abundantly in Nassau (especially on rock walls and exposed limestone street cuts), and on and about the limestone bluffs near the coast at Cave Junction. At the latter locality, the lizards occurred also on saplings and large *Ficus* about the bluffs, and on *Coccoloba* on the coast. In high coppice near Nassau East, *A. distichus* was extremely abundant, both on the trees and saplings and on an old rock wall which extended for some distance through the woods. The species is only moderately common in coppice on Great and Little Exuma.

Specimens examined: BAHAMA IS-

LANDS. *New Providence* (localities not mapped): Nassau, 23 (AMNH 76348-54 + 16); Cave Point, 3 (ASFS 10301-03); Cave Junction, 10 (ASFS V7206-15); 0.9 mi. (1.4 km) W Cave Junction, 2 (ASFS V7226-27); hills south of Lake Cunningham on Gladstone Road, 4 (ASFS V2092-95); Prospect Ridge, 2 (ASFS V2102-03); The Grove, 1 (ASFS V2104); Windsor Field, 1 (ASFS V2110); 0.6 mi. (1.0 km) NW Yamacraw Beach, 1 (ASFS V7242); 0.3 mi. (0.5 km) E Nassau East, 2 (ASFS V10638-39). *Exuma Cays*: Warderick Wells Cay, 3 (AMNH 76326-28); Staniel (= Stanyard) Cay, 5 (AMNH 76329-33); Darby Cay, 2 (AMNH 76334-35). *Great Exuma*: 3.2 mi. (5.1 km) NW George Town, 5 (ASFS V7033-36, ASFS V7053). *Little Exuma*: 5.7 mi. (9.1 km) SE The Ferry, 1 (ASFS V7043). *Long Island*: Simm's, 2 (MCZ 42282-83); Gray's Settlement, 5 (ASFS V8562-64, ASFS V8567-68); 2 mi. (3.2 km) E Gray's Settlement (not mapped), 3 (ASFS V8579-81); Deadman's Cay Settlement, 5 (UMMZ 115596); Clarence Town, 37 (MCZ 37986-95, MCZ 86931-53, UMMZ 80510-2 specimens, FMNH 25372-73); 3.6 mi. (5.8 km) SE Clarence Town (not mapped), 4 (ASFS V10835-38); Roses, 1 (FMNH 22750). *Great Ragged Island*: Duncan Town, 10 (UMMZ 118008-6 specimens; UMMZ 118009-4 specimens).

Anolis distichus distichoides Rosén

Anolis distichoides Rosén, 1911, Lunds Univ. Arskr. N.F., Afd. 2, 7(5):29.

Type locality: Stanniard Creek, Andros Island, Bahama Islands.

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 51 mm, females to 43 mm snout-vent length), dorsum grayish tan to gray and without a green phase, entire dewlap orange to yellowish-orange, modally 1/1 scales between the supraorbital semicircles and interparietal, 0 0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and very

high mean number (8.7) of median azygous head scales correlated with the high incidence (about 50 per cent) of complete separation of supraorbital semicircles medially.

Distribution: The Bahama Islands; known from Andros Island (including Mangrove Cay) and the Berry Islands (known definitely from Frazer's Hog Cay) (Fig. 2).

Comments: The status of *A. d. distichoides* has been disputed in the past. The main claim for its recognition has been the orange dewlap (Pl. I), in contrast to the yellow dewlap of topotypical *A. d. distichus*. Although I have collected very few *distichoides* (as pointed out previously, I have observed it rarely on Andros), those males which I have seen in life have had an orange dewlap consistently. Scale data from 161 *A. d. distichoides* show the following: snout scales 4 to 8 (mode 6), loreal rows 4 to 6 (mode 5); supraorbital semicircles in contact in 108 specimens and completely separated by median azygous head scales in 51 lizards; modally 1 1 scales between semicircles and interparietal and 0 0 supraorbitals in contact with interparietal; 2 2 scales in lateral contact with postfrontals; fourth toe lamellae 15 to 21 (mode 18); median azygous head scales 3 to 14 (mode 9, mean 8.7); "preoccipital" more often present (84 lizards) than absent (74 lizards); postmentals 2 to 8 (mode 4, mean 4.6). The almost equal incidence of presence or absence of the "preoccipital" is noteworthy, although more *distichoides* have this scale than lack it. The high mean of median head scales is correlated with the high frequency of complete separation of the semicircles. No other subspecies of *A. distichus*, either Bahaman or Hispaniolan, has so high a mean, although it is approached most closely (7.9) by the mainland populations of *A. d. floridanus*. South Bimini *A. distichus* likewise have a high incidence of complete semicircle separation, but the mean number of median head scales is much lower (5.5).

The above scale features, especially the high number of median head scales and the high incidence of absence of the "preoccipital," as well as the frequent separation of the supraorbital semicircles, all differentiate *distichoides* from the nominate subspecies. Adult male *A. d. distichus* are also slightly smaller and have a yellow rather than orange or yellow-orange dewlap. Both subspecies resemble each other in dorsal color, although I have not noted *distichoides* being tan in life. As in the nominate subspecies, head markings are suppressed or absent in *distichoides*; the interocular bar is not prominent when present and is often absent. There may be a series of four dorsal chevrons, but these are often obscure or absent, and the degree of dorsal dark striation is likewise variable, with a strong tendency for the lizards to lack striae.

A. d. distichoides is the only Bahaman subspecies which modally has 1 1 scales between the semicircles and the interparietal. Sixty-five lizards fall into this category. On the other hand, 61 lizards have 0 0 scales between the semicircles and the interparietal, so the modality is not strong. The virtually bimodal condition in this scale character is not obviously due to the samples involved; since Andros is a very large island (nearly 100 miles long and up to 40 miles wide) and is much dissected by bights and minor waterways, it was conceivable that the two modalities were due to the pooling of data from two populations which are divergent in this character. This is not the case, since most of the *distichoides* sample under study are from Mangrove Cay, and within this lot of lizards the bimodality is clearly shown.

The size of Andros and the inaccessibility of its west coast is possibly significant in another matter. There is but a single *A. distichus* available from the entire west coast of Andros. This is a female (UF FSM 18005); its sex precludes knowledge of dewlap color and its geographic uniqueness prevents an assessment of the characters of

the populations whence it was taken. The specimen is mentioned here and listed below as *A. d. distichoïdes*, but for several reasons I suspect that the population whence it was derived in actuality represents *A. d. floridanus*. Further comment upon this lizard will be made in the discussion of the history of the latter subspecies.

The occurrence of *A. d. distichoïdes* on the Berry Islands has not been previously reported. Two specimens from Frazer's Hog Cay collected by Richard Thomas are clearly referable to this subspecies; one is a male with an orange dewlap and the other a female. The male has the semicircles completely separated by a median row of 8 scales, and both lizards lack the "preoccipital." Possibly these two lizards might be better associated with the subspecies on South Bimini, but I consider them *distichoïdes* on the basis of provenance and the affinities of the Berry Islands fauna.

Specimens examined: BAHAMA ISLANDS. *Audros Island:* no further locality, 22 (UMMZ 80369-4 specimens, UMMZ 80377-11 specimens, 80381-6 specimens, UMMZ 80384); Morgan's Bluff (not mapped), 7 (UF FSM 17626, UF FSM 17628, UF FSM 17630-32, UF FSM 17634, UF FSM 17637); ca. 0.5 mi. (0.8 km) N Nicholl's Town, 1 (ASFS V6972); Nicholl's Town (not mapped), 1 (UF FSM 18013); Coakley Town, 4 (MCZ 41986-89); south side, mouth of Fresh Creek, 10 (ASFS 10280-86, UMMZ 115598-3 specimens); Mangrove Cay, 103 (MCZ 42013 + 15 untagged specimens, AMNH 63073-19 specimens, UMMZ 260210-4 specimens, UMMZ 109223-5 specimens, UMMZ 115597-34 specimens, plus 25 untagged specimens from AMNH 63067); south side, South Bight, 1 (MCZ 42001); Little Creek, 5 (UMMZ 118006); Pure Gold (not mapped), 15 (MCZ 42026-29 + 11 specimens); west coast, 2 mi. (3.2 km) at 55° from mouth of Deep Creek (not mapped), 1 (UF FSM 18005). *Berry Islands:* Frazer's Hog Cay, 2 (ASFS V10667-68).

Anolis distichus biminiensis Oliver

Anolis distichus biminiensis Oliver, 1948, Amer. Mus. Novitates, No. 1383:16.

Type locality: Western end of South Bimini Island, Bahama Islands.

Definition: A subspecies of *A. distichus* characterized by small size (males to 50 mm, females to 44 mm snout-vent length), dorsum pale gray and without a green phase, dewlap orange, modally 0/0 scales between the supraorbital semicircles and the interparietal, 2/2 supraorbitals in contact with the interparietal, 3/3 scales in contact laterally with the postfrontals, and high mean number (5.5) of median azygous head scales.

Distribution: The Bahama Islands: known only from South Bimini (Fig. 2).

Comments: At the time of the description of *A. d. biminiensis*, Oliver had twenty specimens of this subspecies. Additional lizards taken since that time confirm his diagnosis of the race. Most striking, in comparison with all other subspecies, is the postfrontal contact with 3/3 scales laterally and the modal 2/2 supraorbitals in contact with the interparietal. Data for the series of 44 specimens are: snout scales 4 to 6 (mode 4), loreal rows 4 to 6 (mode 5); supraorbital semicircles in contact in 30 specimens and completely separated by median azygous head scales in 13 lizards; modally 0/0 scales between semicircles and interparietal and 2/2 supraorbitals in contact with interparietal; fourth toe lamellae 14 to 19 (mode 16); median azygous head scales 1 to 10 (mode 5, mean 5.5); "preoccipital" usually absent (41 of 44 lizards; see comments below); postmentals 4 to 6 (mode 5, mean 4.8). Of the three lizards which have the "preoccipital" present, in one (AMNH 68638) the scale is very tiny and in the second (AMNH 68637) the scale which I consider the "preoccipital" may in actuality be a fragment of the interparietal. Only in one lizard (CM 32552) is there an unequivocal "preoccipital" present. In having such a high percentage of absence

(by fusion) of the "preoccipital," *biminiensis* stands alone among all subspecies of *A. distichus*.

Aside from the scale characters noted above, *A. d. biminiensis* differs from *A. d. distichus* in the color of the dewlap—orange in the former (Pl. 1) and yellow in the latter. In this feature *biminiensis* resembles *distichooides*; it seems very likely that the population on South Bimini is a direct derivative of *distichooides* on Andros, with resulting intensification by isolation of some of the characters of the Andros subspecies.

A. d. biminiensis usually is a gray lizard, but it is capable of turning a rich velvety brown. The shade of the orange dewlap is that of plate 9 I 10 and plate 10 L 9; all color designations are from Maerz and Paul, 1950. The venter is creamy to whitish or grayish, and the underside of the tail and hindlimbs has been noted as pale yellow (pl. 17 J 1). Head markings and dark body striae are usually obsolete, but the interocular bar is at least often indicated, and young lizards show both the interocular bar and an occipital dark V.

Oliver (1948:22) noted that *A. d. biminiensis* was encountered at low heights on light gray colored trees such as *Ficus* and *Coccothrinax*. More recently *biminiensis* has been collected on trees in hammock woods (high coppice) as well as on isolated *Ficus*. The absence of *A. distichus* from North Bimini is puzzling. Sutcliffe (1952) did not report the species from North Cat Cay south of South Bimini in the chain, but Wayne King advises me that he has collected the species in this chain but the specimens have been lost. Presumably the absence of *A. d. biminiensis* from North Bimini (paralleled by that of *Sphaerodactylus decoratus flavicaudus* Barbour, which also occurs, among the Biminis, only on South Bimini) is due to a fluke of colonization from Andros, and the lizards have been unable to cross even the narrow water gap between South and North Bimini.

Specimens examined: BAHAMA ISLANDS. *South Bimini:* no other locality,

3 (MCZ 80132–34); western end, 12 (ASFS X4709–15, ASFS X4721–24, ASFS X4932); western part, 2 (ASFS V10750–51); west end, 27 (AMNH 68637–38 + 6 specimens, AMNH 68639 + 8 specimens, MCZ 49739–40, UMMZ 118303, CM 34118–20, CM 32549–52).

*Anolis distichus dapsilis*³ subsp. n.

Holotype: MCZ 81139, an adult male, from ocean side, opposite Hatchet Bay, Eleuthera Island, Bahama Islands, one of a series taken 15 June 1966 by Richard Thomas. Original number V10385.

Paratypes (all from Eleuthera Island, Bahama Islands): ASFS V10386–405, same data as holotype; ASFS 17144–49, Alicetown, 23 October 1961, native collector; ASFS 17167–74, Alicetown, 24 October 1961, native collector; ASFS 17176–82, Alicetown, 25 October 1961, native collector; AMNH 96509–15, ANSP 27163–69, CM 40623–29, KU 93380–86, MCZ 92001–08, UIMNH 61696–700, UF FSM 21526–33, USNM 160692–99, Alicetown, 26 October 1961, native collector; ASFS 17498–500, Alicetown, 30 October 1961, native collector; ASFS 17151, Hatchet Bay (not mapped), 24 October 1961, A. Schwartz; ASFS V6799–800, 4 mi. (6.4 km) N Rock Sound, 2 October 1965, R. Thomas; ASFS V6864, 4 mi. (6.4 km) NW, thence ca. 2 mi. (3.2 km) E Rock Sound, 5 October 1965, R. Thomas; ASFS V6811, Southeast Point, 4 October 1965, R. Thomas.

Definition: A subspecies of *A. distichus* characterized by small size (males to 50 mm, females to 45 mm snout-vent length), dorsum pale ashy gray with a yellowish cast and without a green phase, dewlap orange with occasionally a very narrow yellow border, modally 0 0 scales between the supraorbital semicircles and the interparietal, 0 0 and 1 2 supraorbitals in contact with interparietal, 2 2 scales in contact laterally with the postfrontals, and

³ From Latin, *dapsilis*, plentiful.

high mean number (6.2) of median azygous head scales.

Distribution: The Bahama Islands: known only from Eleuthera Island (Fig. 2).

Comments: The holotype has the following measurements and scale counts: snout-vent length 50 mm, tail 42 mm, distal half regenerated; 4 scales across snout, 4 loreal rows, semicircles in contact, 0/0 scales between supraorbital semicircles and interparietal, 2/2 supraorbitals in contact with interparietal, 2/2 scales in lateral contact with postfrontals, 15 fourth toe lamellae, 4 median azygous head scales, "preoccipital" present, 4 postmentals.

Scale counts for the series of 107 *A. d. dapsilis* are: snout scales 4 to 7 (mode 6), loreal rows 3 to 5 (mode 4); supraorbital semicircles in contact in 99 specimens and completely separated by median azygous head scales in six lizards; modally 0/0 scales between semicircles and interparietal and 0/0 and 1/2 (both with 24 lizards) supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 14 to 20 (mode 17); median azygous head scales 2 to 11 (mode 6, mean 6.2); "preoccipital" usually present (93 of 107 lizards); postmentals 4 to 9 (mode 6, mean 5.2).

The dorsum of *A. d. dapsilis* is usually pale ashy gray with a yellowish cast, and the head in adults regularly lacks any darker markings, including the interocular dark bar. In subadults and juveniles, the interocular bar and occipital V are somewhat more obvious. The dorsum lacks longitudinal dark striae but may be vaguely streaked with darker gray. The dewlap is completely orange, or orange with a very narrow yellow edge; hues noted for the dewlap are those of plate 11 C 10 and plate 10 E 12, and the yellow border has been noted as that of plate 10 H 3. The eye ring is white and the eye skin gray or tan, the latter in contrast to the gray head and dorsum. There is no evidence that *dapsilis* has a dark brown phase, but I assume that this color occurs. One lizard

was recorded as being pale gray with a very faint greenish cast when caught.

A. d. dapsilis differs from *A. d. distichus* in dewlap color (orange versus pale yellow) and in reaching a very slightly larger size; in this latter context, Etheridge (1966: 351) reported 48 mm as the maximum size for New Providence specimens and 53 mm as a maximum on Eleuthera. Although none of the 107 *A. d. dapsilis* examined by me is so long as that reported by Etheridge, his data indicate that *dapsilis* is even larger than *A. d. distichus*.

The Eleuthera subspecies resembles *distichoides* and *biminiensis* in dewlap color. It differs from these two more western subspecies in several ways: the 2/2 lateral postfrontal contact separates *dapsilis* from *biminiensis* with 3/3, and the higher mean number of median head scales (8.7) in *distichoides* differentiates that form from *dapsilis* (with 6.2). *A. d. biminiensis* and *A. d. distichoides* both have the supraorbital semicircles more often separated than does *dapsilis*, and both the western subspecies more regularly lack the "preoccipital."

The holotype and paratopotypes from the ocean side of Eleuthera at Hatchet Bay were taken from saplings around the edges of an abandoned and overgrown *Cocos* grove. The specimens from Alicetown were from an edificarian situation. *A. d. dapsilis* is common on Eleuthera; I observed many at Hatchet Bay Plantation on isolated *Lysiloma* trees on the lawns and in high coppice between Hatchet Bay and The Glass Window. Considering the quantity of specimens examined by me, as well as many more in collections which I have not studied, *A. d. dapsilis* must be the commonest subspecies of *A. distichus* in the Bahamas.

*Anolis distichus ocior*⁴ subsp. n.

Holotype: MCZ S1140, an adult male, from Port Nelson, Rum Cay, Bahama Islands, one of a series taken 20 June 1966

⁴ From Latin, *ocior*, more rapid.

by Albert Schwartz and Richard Thomas. Original number V10488.

Paratypes (all from Rum Cay, Bahama Islands): ASFS V10489-90, ASFS V10493-94, MCZ 81147-48, same data as holotype; ASFS V10418-21, Summer Point, 17 June 1966, R. Thomas; ASFS V10446, Port Nelson, 17 June 1966, R. Thomas; ASFS V10473, Summer Point, 18 June 1966, R. Thomas.

Associated specimens: BAHAMA ISLANDS. *San Salvador* (localities not mapped): no further locality, 7 (MCZ 36729-31, FMNH 222, FMNH 225-26, FMNH 263); Cockburn Town, 19 (ASFS V2277, ASFS V2279-81, ASFS V2297-302, ASFS V2355-60, ASFS V2285); 4.2 mi. (6.7 km) N Cockburn Town, 1 (ASFS V10572); 9.9 mi. (14.9 km) by road N Cockburn Town, 1 (ASFS V10539); 7.1 mi. (11.4 km) N Cockburn Town, 1 (ASFS V2292); 1.2 mi. (1.9 km) N Dixon Hill, 1 (ASFS V2278); Dixon Hill, 3 (ASFS V2286-88); Sandy Point House, 7.6 mi. S Cockburn Town, 10 (ASFS V10559-67, RT 1464); 2.3 mi. (3.7 km) E Watling's Castle (= Sandy Point House), 1 (ASFS V2339); *Green Cay*, 1 (ASFS V10625); *Man Head Cay*, 1 (ASFS V2337).

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 53 mm, females to 48 mm snout-vent length), dorsum yellow-gray to brown with a prominent pale flank stripe between the fore- and hindlimbs bordered above and below by dark brown or gray and with a pea-green phase, dewlap pale yellow, modally 0/0 scales between the supraorbital semicircles and the interparietal, 1/1 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and high mean number (5.8) of median azygous head scales.

Distribution: The Bahama Islands; known from Rum Cay and San Salvador, including its satellites Green Cay and Man Head Cay (Fig. 2).

Comments: The holotype has the following measurements and scale counts: snout-

vent length 53 mm, tail ca. 90 mm; 6 scales across snout, 4 loreal rows, semicircles in contact, 1/1 scales between supraorbital semicircles and interparietal, 0/0 supraorbitals in contact with interparietal, 3/3 scales in lateral contact with postfrontals, 19 fourth toe lamellae, 7 median azygous head scales, "preoccipital" present but somewhat fragmented, 7 postmentals.

Scale counts for the series of 59 *A. d. ocior* are: snout scales 4 to 8 (mode 6), loreal rows 3 or 4 (mode 4); supraorbital semicircles in contact in 49 specimens and completely separated by median azygous head scales in nine lizards; modally 0/0 scales between semicircles and interparietal and 1/1 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 15 to 19 (mode 17); median azygous head scales 2 to 10 (mode 6, mean 5.8); "preoccipital" usually present (55 of 57 specimens); postmentals 5 to 9 (mode 7, mean 6.7).

Dorsally, Rum Cay *A. d. ocior* varies from unstriate gray to brown, but most specimens observed were some shade of green, from a grayish pastel green to a rich pea-green. There is a complete cream labial stripe which extends above the shoulder and continues down the flank between the fore- and hindlimbs and is bordered both above and below by dark gray (dark gray-green in the green phase) or brown. The green phase of *ocior* is fairly bright, but not so bright a green as, for example, *Anolis carolinensis*. In the green phase there are no head markings, but an occipital V is often present in the gray phase. The dewlap is yellow (Pl. 1). The venter is a rich yellowish tan in all phases, slightly brighter (more yellow) under the tail and along the lower lips.

Specimens from San Salvador differ from those from Rum Cay described above in that they do not show the green phase so consistently nor quite so brightly. The cream subocular mark is conspicuous, and the flank stripe is present but not so distinct nor so regularly bordered with darker as in

Rum Cay lizards. The dewlap is yellow on San Salvador. In scutellation, Rum Cay and San Salvador specimens are completely comparable in both modes and means in all counts taken; the largest female (48 mm) is from the small series from Rum Cay, whereas the largest female from the much longer San Salvador series is smaller (44 mm). I group the lizards from these two islands together, since it is apparent that they are derivative populations which together are more divergent from the balance of the Bahaman populations than they are from one another. Isolation on San Salvador and Rum Cay has resulted in some differentiation *in situ*, but not sufficient for nomenclatorial recognition.

A. d. ocior differs from all other Bahaman subspecies in having a green phase. From *biminiensis*, *distichooides* and *dapsilis*, *ocior* differs in having a yellow rather than an orange dewlap. The Rum Cay-San Salvador subspecies resembles *A. d. distichus* in dewlap color, but has 1/1 supraorbitals in contact with the interparietal in contrast to 0/0 in the nominate race, and also is larger and has a green phase, which *A. d. distichus* lacks. *A. d. ocior* is the only Bahaman subspecies with 1/1 supraorbitals in contact with the interparietal, and has the highest mean number of postmentals (6.7) of any Bahaman subspecies; the highest postmental mean other than that of *ocior* is that of *distichus* (5.5) among the Bahaman subspecies.

On Rum Cay, *A. d. ocior* is uncommon; all of our specimens were taken in edificarian situations, especially on *Cocos*, *Lysiloma*, and *Terminalia* in Port Nelson and on a *Lysiloma* near a cottage at Summer Point. Lizards were also observed on *Thrinax* palms near the beach, but not commonly. On San Salvador, *A. d. ocior* is more abundant, but is still not so common as is *A. d. distichus* on New Providence or *A. d. dapsilis* on Eleuthera, for instance. Specimens were collected on *Ficus* and *Terminalia* in Cockburn Town and were observed on exposed fence posts in com-

pany with *Anolis sagrei*; the latter species was more common in such situations. At Sandy Point House, *A. d. ocior* was extremely abundant on saplings about the ruins and on the walls of the ruins themselves. On Green Cay, *A. d. ocior* is moderately common on *Coccoloba* tangles, and the single lizard from Man Head Cay was taken under a flat rock among strand plants.

Rum Cay and San Salvador stand isolated from the Great Bahama Bank on two separate banks of their own. Rum Cay lies closest to Long Island (which is inhabited by *A. d. distichus*), whereas San Salvador is about equidistant from Long Island and Cat Island (but is closer to Rum Cay than to either of these). Aside from *Cyclura rileyi* Stejneger and *Leptotyphlops columbi* Klauber which are endemic to San Salvador, and *Sphaerodactylus corticola* Garman which occurs on both islands, the herpetofauna of Rum Cay and San Salvador is depauperate. Doubtless *A. d. ocior* has been a long resident of these two islands; it has diverged strikingly from the balance of the Bahaman subspecies.

CAT ISLAND

Cat Island, located on its own bank along with Little San Salvador, lies southeast of Eleuthera (which is inhabited by *A. d. dapsilis*), east of the Exuma Cays (which are inhabited by *A. d. distichus*) and northwest and west of Rum Cay and San Salvador (which are inhabited by *A. d. ocior*). I have examined 27 *A. distichus* from Cat Island, of which 14 were freshly taken by Dennis R. Paulson. These lizards I leave unassigned subspecifically, although I doubt that they merit nomenclatorial separation from the balance of the Bahaman subspecies.

In dorsal color and pattern, the Cat Island lizards resemble New Providence *A. d. distichus*. They do not have a green phase and thus are unlike *ocior*, but like *distichus* and *dapsilis*. The dewlap coloration is variable—more so than in any other

Bahaman race; in a single series, Paulson noted that three had pale yellow dewlaps, one had a yellow dewlap with an orange center, and the fifth had an orange dewlap with a narrow yellow edge. Thus, in dewlap color, the Cat Island lizards combine (are intermediate in?) the characters of both *distichus* and *ocior*, on the one hand, and *dapsilis*, on the other.

In the relationships between the interparietal and supraocular semicircles, the Cat Island lizards are not distinctive and resemble both *distichus* and *dapsilis* but not *ocior* (which modally has 1/1 supraorbitals in contact with the interparietal, in contrast to 0/0 or 1/2 in *distichus* and *dapsilis*). The "preoccipital" is absent in six of 24 lizards; this is a higher proportion than *dapsilis*, *distichus* or *ocior*. The mean of median head scales is 4.8, in strong contrast to 6.2 in *dapsilis*, 6.0 in *distichus*, or 5.8 in *ocior*. The postmental mean is 6.0, higher than both *distichus* and *dapsilis*, but lower than *ocior*. The postfrontal contact is bimodal, with both 2/2 and 3/3 having equal frequencies of eight lizards; there is also a strong tendency (as intimated by the bimode of 3/3) for Cat Island lizards to have 3/4 and 4/4 scales in contact laterally with the postfrontals (18 of 26 lizards have three scales in contact unilaterally), whereas counts above 2/3 are relatively uncommon in *distichus* (22 of 128 lizards), *dapsilis* (five of 102 lizards) and *ocior* (six of 59 lizards). Such high lateral postfrontal contact counts are more usually encountered in *biminiensis* (23 of 42 lizards). It should be recalled that 3/3 is the modal condition in *biminiensis*.

On the basis of dewlap color, it would seem appropriate to consider the Cat Island lizards intermediate between *distichus* and *dapsilis*, and the geographic position of Cat Island is in accord with a possibly double "invasion" of lizards from the islands to the northwest and west. I can see no *ocior* influence in the Cat Island lizards. In contrast to the situation with the dewlap color, the scale counts present

a peculiar melange of characters which cannot reasonably be attributed to interaction of the two adjacent races. It is probable that Cat Island has been colonized at various times by both *distichus* and *dapsilis*, but that there has been imposed upon these two parent stocks other local differentiation on Cat Island, so that the Cat Island lizards resemble their parent stocks in some characters but have diverged considerably in others.

Specimens examined: BAHAMA ISLANDS. *Cat Island*: Orange Creek, 7 (ASFS V2145-51); Arthur's Town, 7 (MCZ 39580-83, UMMZ 79449); Bennett's Harbour, 4 (AMNH 76337-40); Tea Bay, 2 (ASFS V2159-60); The Bight, 5 (ASFS V2188-91, CM 20444); hills above The Bight, 1 (ASFS V2123); 1 mi. (1.6 km) S McQueen, 1 (AMNH 76336).

Anolis distichus dominicensis Reinhardt and Lütken

Anolis dominicensis Reinhardt and Lütken, 1863. Vid. Medd. Nat. Foren. Kjøbenhavn: 261.
Anolis distichus albidogularis Mertens, 1939, Abh. Senckenberg. Naturf. Ges., 449:59.

Type locality: Haiti; restricted to Port-au-Prince, Dépt. de l'Ouest, Haiti.

Definition: A subspecies of *A. distichus* characterized by very large size (males to 58 mm, females to 48 mm snout-vent length), dorsum varying between all green and all dark brown with darker longitudinal striae in all phases, dewlap pale yellow (occasionally white or almost so) to yellow with a faint orange basal blush, modally 1/1 scales between the supraorbital semicircles and the interparietal, 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals and moderate mean number (3.9) of median azygous head scales.

Distribution: All of Haiti with the exception of the Tiburon Peninsula west of Miragoâne (precise limits along the southern coast of the Tiburon Peninsula at the longitude of Miragoâne unknown); the República Dominicana in extreme western

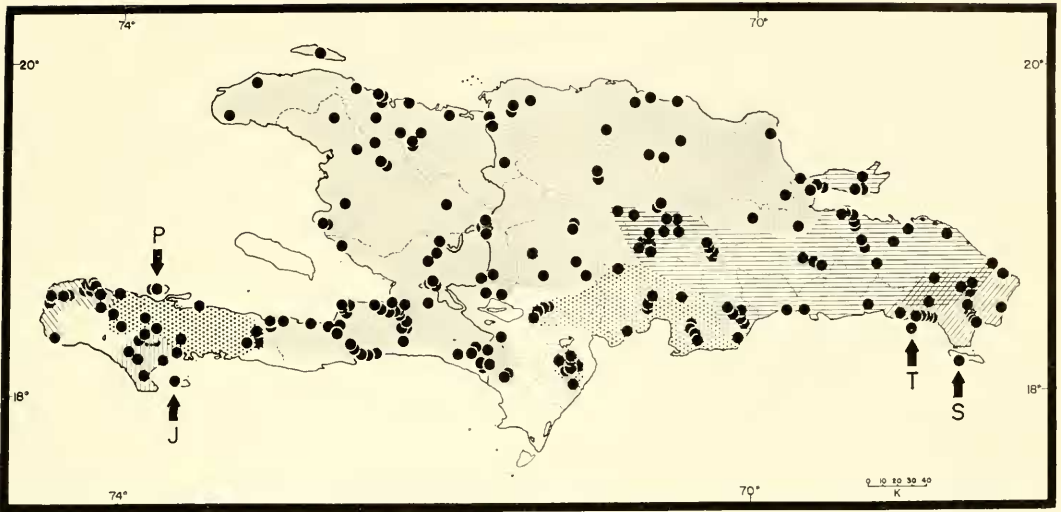


Figure 3. Map of Hispaniolo, showing distribution of the subspecies of *Anolis distichus*; fine diagonal lines, *A. d. dominicensis*; horizontal lines, *A. d. ignigularis*; diagonal lines, upper right to lower left, *A. d. properus*; open stippling, *A. d. rovirerum*; crosshatching, *A. d. favillarum*; close stippling, *A. d. aurifer*; vertical lines, *A. d. vinosus*; diagonal lines, upper left to lower right, *A. d. suppar*; P, *A. d. patruelis*; J, *A. d. juliae*; T, *A. d. tostus*; S, *A. d. sejunctus*.

Pedernales Province on the south, through extreme western Independencia Province, thence east through San Juan Province to northern La Vega Province (Jarabacoa), Sánchez Ramírez Province (Cotuí), San Cristóbal Province (Gonzalo), and Samaná Province (mouth of the Río Yuna), and north to the northern coast in María Trinidad Sánchez Province (Cabrera), but excluding the Península de Samaná; possibly the Ile de la Tortue off the northern coast of Haiti (Fig. 3).

Comments: *A. d. dominicensis* has the widest distribution of any of the Hispaniolan subspecies. Throughout this wide range, it is remarkably constant in dewlap and dorsal colorations. The dewlap is most often pale yellow (Pl. I), but at times (and not segregated geographically) there is a vague and pale orange basal blush on the otherwise yellow dewlap. Occasional specimens (for example, in the Sierra de Baoruco in Pedernales Province and at Cap-Haïtien in northern Haiti) have the dewlap very pale yellow to practically white.

In the green phase, the ground color is

fairly bright and marbled and/or streaked with green, brown, black, or yellow. The head is pale green, and the ventral color varies from pale green to gray or even black. The underside of the tail ranges from bright yellow to yellow-orange. In the brown phase, the back is a rich chocolate or wood brown; some specimens seem incapable of achieving a uniform brown and have a marbled or mottled pattern of darker and lighter browns. There is an intermediate color phase (greenish tan or grayish brown), which presumably is assumed between the definitive green or solid brown conditions.

Scale counts of the series of 245 *A. d. dominicensis* are: snout scales 4 to 10 (mode 4), loreal rows 3 to 7 (mode 4); supraorbital semicircles always in contact; modally 1 1 scales between the semicircles and the interparietal and 0 0 supraorbitals in contact with the interparietal; 2 2 scales in lateral contact with postfrontals; fourth toe lamellae 14 to 24 (mode 19); median azygous head scales 2 to 11 (mode 3, mean 3.9); "preoccipital" almost always present (235 of 251 lizards); postmentals

2 to 12 (modes 6 and 7, mean 6.6). The largest males are from the higher elevations in the Montagne Noire. These elevations (5000 and 5600 feet—1525 and 1708 meters) are among the very highest at which *A. distichus* has been collected. *A. d. dominicensis* also occurs at sea level in many coastal situations, and below sea level in the extreme eastern Cul de Sac Plain.

The specimens from the eastern Cul de Sac Plain are of special interest. In this region (Thomazeau, Manneville), the dorsal coloration is like that of specimens from the uplands on the northern slopes of the Morne l'Hôpital (Pétionville, Morne Calvaire, for instance), but the dewlap color is a deep orange (pl. 4 C 11, pl. 4 G 10 and pl. 4 G 11), at times with a faintly brown cast. This is one of the regions where *A. distichus* is sympatric (but not syntopic) with *A. brevirostris*, which in this same area has an orange dewlap. Of the two species in the Thomazeau-Manneville area, *A. brevirostris* is distinctly the inhabitant of the xeric scrub and *A. distichus* the inhabitant of more mesic situations, oases, and cultivated areas. In this region, *A. brevirostris* is the widespread lizard of open areas, whereas *A. distichus* is restricted to certain less rigorous habitats and is in effect surrounded by *A. brevirostris*. The orange dewlap of *A. distichus* may well be the result of partial or complete isolation of the *A. distichus* populations from the balance of the species. To the east, in the Valle de Neiba in the República Dominicana, *A. d. dominicensis* remains unknown, but is replaced to the east of Lago Enriquillo by the western extreme of another subspecies. Doubtless *A. d. dominicensis* will ultimately be collected between the Dominico-Haitian border and the western end of Lago Enriquillo in the República Dominicana.

Considering the fact that *A. d. dominicensis* occurs at a great variety of elevations, it is obvious that it also occupies a great variety of habitats, from the hot oases in the Cul de Sac Plain to upland

mesic cacao groves and rain forest. Cultivated lands are quite suitable, and it is often the dominant anole of shady fence rows and the interior of humid coffee plantings and woods. Along the coast it occurs in mangroves (Trou Forban), mesic and open banana-breadfruit-royal palm associations, on large trees in open cultivated semi-arid regions, and it is common almost everywhere, at least where a minimal patch of shady woods occurs. In the hot and dry Valle de Cibao, *A. d. dominicensis* was encountered in thorn and tree-cactus scrub but in the more shady situations. In short, throughout its broad Hispaniolan range, *A. d. dominicensis* is encountered in almost any situation which offers shade and refuge.

I have noted in the introduction the sleeping habits of *A. d. dominicensis* at Miches and Palo Verde in the República Dominicana. One other observation has been made; two *A. d. dominicensis* were taken sleeping exposed on a large, wet log lying adjacent to a rushing stream, in a deep and cool montane ravine at 2200 feet (671 meters), near Puesto Grande in the Cordillera Septentrional in northern República Dominicana.

I do not regard *A. d. albidogularis* Mertens as a valid subspecies. Mertens was misled into the description of *albidogularis* by the material which he regarded as *dominicensis* from Haiti; his "*dominicensis*" were three males and a female from Gonaïves, and two males and a female from St. Marc. His comments (1939:56) on the distinguishing characters of *A. d. dominicensis* (as based upon these seven specimens) do not apply to *dominicensis*—i.e., that *dominicensis* is never green but rather is gray to gray-brown, has a bright and clear supralabial streak, a pair of dark scapular spots and a lined dorsum, and a chrome-orange-yellow dewlap with citron-yellow scales. These are precisely the characters—especially the always gray color and the pair of scapular spots and a lined dorsum—which distinguish the species *A. brevirostris* from *A. distichus*. It is apparent

that Mertens, when describing *albidogularis*, did not have for comparison specimens of *A. d. dominicensis*, as he presumed, but rather *A. breviostris*. The characters of *albidogularis* are those of *dominicensis*, and specimens from the vicinity of the type locality (Monte Cristi, República Dominicana) do not differ significantly in any feature from topotypical Port-au-Prince material. The pale dewlap coloration which is ascribed to *albidogularis* is not consistent in the Valle de Cibao population and occurs only sporadically elsewhere; specimens which I have collected near Monte Cristi and in the Valle de Cibao have the dewlap color pale yellow, as do specimens from elsewhere within the range of *A. d. dominicensis*.

A. d. dominicensis differs from all the Bahaman subspecies except *ocior* in having a green phase; the green of *ocior* is a much more yellow-green than the green of *dominicensis*. Of the Bahaman subspecies, all are smaller than *dominicensis*; *ocior* most closely approaches *dominicensis* in size. The median head scale mean of *dominicensis* (3.9) is lower than that of any Bahaman race (5.5 to 8.7). Only *distichoides* in the Bahamas has the 1:1 scales between the semicircles and the interparietal as does *dominicensis*. Other head scale differences (such as the regular presence of the "preoccipital" and the regular contact between the semicircles in *dominicensis*) are also significantly different in comparison with the Bahaman subspecies.

A. d. dominicensis presumably comes into contact with four other subspecies. In one of these instances (Sierra de Baoruco) no intergradient specimens are known, since there is an hiatus between the closest records of *dominicensis* and this next adjacent form to the east. In three instances, however (*ignigularis*; the subspecies to the west on the Tiburon Peninsula; and the subspecies to the east in the Valle de Neiba), there are samples which I interpret as intermediates. In the case of *ignigularis*, the material from the higher elevations in

the eastern portion of the Cordillera Central (vicinity of Constanza, Paso Bajito, etc.) shows the dewlap rather intermediate between the yellow or yellow-with-orange-blush *dominicensis* condition and the solid orange dewlap with a narrow yellow border of *ignigularis*, although the dewlap in general is much closer to that of *ignigularis* than to that of *dominicensis*. I have included these Cordillera specimens with *ignigularis* for that reason.

A small series from Padre las Casas, Azua Province, República Dominicana, I interpret as intergradient between *dominicensis* and the Valle de Neiba-Llanos de Azua subspecies. This lot is closer to the latter race, and I have discussed it in detail there. Finally, lizards from the vicinity of Saint Michel du Sud on the Tiburon Peninsula are intermediate in dewlap color between *dominicensis* and the next adjacent race to the west on the Peninsula (which has a deep orange dewlap with a narrow yellow edge), but they are closer to the latter subspecies, and I have included them in the discussion of that race rather than with *dominicensis*.

I have seen no fresh material from Ile de la Tortue and only three old specimens which are distinctive in neither scutellation nor what is discernible of pattern or pigmentation. I include Tortue in the range of *A. d. dominicensis* only provisionally, since on all other satellite islands where *A. distichus* is found, it is racially distinct. Thus there is a good likelihood that fresh specimens from Tortue will demonstrate that there is a different subspecies present there.

Referred specimens: HAITI. *Dépt. du Sud:* Miragoâne, 30 (MCZ 25489-98 + 20 untagged specimens); Butète, nr. Miragoâne (not mapped), 7 (MCZ 66133-39); Etang Miragoâne, 7 (MCZ 66140-46). *Dépt. de l'Ouest:* 7.1 mi. (11.4 km) E Miragoâne, 1 (ASFS X3850); 3 mi. (4.8 km) W Grand Goâve, 300 feet (92 meters), 1 (ASFS X3856); 1.1 mi. (1.8 km) NE Fauché, 2 (ASFS X2045-46); 5 km S Dufort, 4 (MCZ

63099-102); 4 mi. (6.4 km) SE Léogâne, 4 (ASFS V8463-66); Léogâne, 2 (MCZ 13779-80); Ça Ira, 9 (MCZ 63898-906); bridge over Rivière Momanca on road to Léogâne, 1 (MCZ 63103); Mariani, 7 mi. (11.2 km) E Gressier, 7 (ASFS V8446-52); Diquini, 17 (MCZ 59430-32, MCZ 8696-700, MCZ 8703, MCZ 8705, MCZ 8710, MCZ 8712, MCZ 8714-18); Port-au-Prince, 1 (MCZ 51427); Boutillier Road, S of Port-au-Prince, 17 (MCZ 59413-29); SW of Port-au-Prince (not mapped), 1 (MCZ 51258); 2.8 km S Pétienville, 1700 feet (519 meters), 2 (ASFS V8117-18); 5 mi. (8.0 km) NE Pétienville, ca. 160 meters, 3 (ASFS V9405-07); 3 km (airline) W Pétienville, Morne l'Hôpital, 920 meters, 11 (ASFS V8435-45); Morne Calvaire, 1 mi. (1.6 km) SW Pétienville, 2300 feet (702 meters), 44 (ASFS X1237-80); Kenscoff, 2 (MCZ 45745, MCZ 59401); Morne Bourette (not mapped), 2 (MCZ 47546 + one untagged specimen); Peneau, 5000 feet (1525 meters), 4 (ASFS X1350-51, ASFS X1574-75); Furcy, 5600 feet (1708 meters), 45 (ASFS X1591-95, MCZ 63535-39, MCZ 59393-97, MCZ 59433-41); Peneau and Furcy, ca. 4000-5000 feet (1220-1527 meters), 4 (ASFS V4821-44); Hatte Lathan (not mapped), 2 (MCZ 51421-22); Thomazeau, 4 (MCZ 13771-72, MCZ 37455, USNM 59191); near Thomazeau, 2 (MCZ 37495-96); Tête Source, 1.4 km NNE Thomazeau, 3 (ASFS V8173-75); Manneville, 9 (ASFS V8194, CM 38881, MCZ 59390-92, MCZ 63107-10); Ste. Philomène (not mapped), 1 (MCZ 51428); 3.9 mi. (6.2 km) NW Ganthier, 1 (ASFS X2171); Gormand, nr. Saltrou (not mapped), 2 (MCZ 68614-15); Colombier, nr. Saltrou, 4 (MCZ 68616-19); Lan Banane, nr. Saltrou, 5 (MCZ 68620-24); Tête à l'Eau, nr. Saltrou, 6 (MCZ 68625-30); Thiotte, nr. Saltrou, 9 (MCZ 69631-39); Caroye, nr. Saltrou (not mapped), 31 (MCZ 69315-45); Londry, nr. Saltrou (not mapped), 4 (MCZ 69346-49); Citadelle, nr. Saltrou (not mapped), 15 (MCZ 69350-64); Maviète, nr. Saltrou (not mapped), 15 (MCZ 69365-79); Mapou, nr. Saltrou, 7 (MCZ 69380-86); ca. 3.5 mi. (5.6 km) NE Trouin, 800 feet (244 meters), 1 (ASFS V9664); 5 mi. (8.0 km) S Trouin, 700 feet (214 meters), 3 (ASFS V9668-70); Jacmel, 1 (ASFS V9825); ca. 5.5 mi. (8.8 km) NW Jacmel, 600 feet (183 meters), 1 (ASFS V9784); 3 mi. (4.8 km) E Jacmel, 2 (ASFS V9757-58); ca. 1 mi. (1.6 km) W Cayes Jacmel, 4 (ASFS V9700-03); 10 mi. (16.0 km) NNE Marigot, 3200 feet (976 meters), 1 (ASFS V9737); Trou Forban, 1 (ASFS V8216); 1.6 km SW Trianon, 1100 feet (336 meters), 3 (ASFS V8278-80); 1.6 km NE Trianon, 6 (ASFS V8282-87); 7 mi. (11.2 km) N Mirebalais, 1 (ASFS X2234); La Tombe, nr. Mirebalais (not mapped), 21 (MCZ 68204-24); Fer-à-Cheval, nr. Mirebalais, 5 (MCZ 68225-29); Boudou, nr. Mirebalais (not mapped), 13 (MCZ 68230-42); Ledie, nr. Mirebalais (not mapped), 4 (MCZ 68243-46); Dubuisson, nr. Mirebalais (not mapped), 3 (MCZ 68247-49). *Dépt. de l'Artibonite*: south end, Etang Bois Neuf, 1 (MCZ 59942); Pierre Payen, 8 (MCZ 59402-03, MCZ 59407-12); bridge over Rivière de l'Artibonite, St. Marc road, 2 (MCZ 59404-05); Passe Reine, 3 (MCZ 63055-57); 8 to 9 km W Marmelade, 3500 feet (1068 meters), 2 (ASFS V9913-14); 5 mi. (8.0 km) NW St. Michel de l'Atalaye, 4 (ASFS V10030-33); 2 mi. (3.2 km) NW St. Michel de l'Atalaye, 2 (ASFS V10034-35); Hinche, 5 (MCZ 25499-503); Gros Morne, 8 (MCZ 63075-82). *Dépt. du Nord*: 3 mi. (4.8 km) NW Terrier Rouge, 1 (ASFS V10163); Dondon, 10 (MCZ 63063-72); Dondon, southeastern outskirts, 4 (ASFS V10017-20); ca. 2 km S Dondon, 2 (ASFS V10038-39); Grande Rivière du Nord, 13 (MCZ 66655-67); Cap-Haïtien, 94 (MCZ 37483-92 + 69 untagged specimens, MCZ 63058-62, ASFS V10194-204); Ti Guinin, near Cap-Haïtien (not mapped), 8 (MCZ 66668-75); Citadelle Lafèrrière, 7 (MCZ 33370, MCZ 63073-74, MCZ 66651-54); nr. Citadelle Lafèrrière, 2 (MCZ 25487-88); 4 mi. (6.4 km) SSW Limbé, 200 feet (61 meters), 1 (ASFS

V9964); 4 mi. (6.4 km) N Port Margot, east side of Rivière de Port Margot, 1 (ASFS V9971); ca. 2 km inland from Anse à Margot, 1 (ASFS V10277); Chouchou, 10 mi. (16.0 km) NW Port Margot, 6 (ASFS V9978-83); 1 mi. (1.6 km) SW Le Borgne, west side Rivière du Borgne, 2 (ASFS V10001-02); *Dépt. du Nord Ouest*, Jean Rabel, 1 (MCZ 63098); Bombardopolis, 15 (MCZ 63083-97). *Ile de la Tortue*: 3 (MCZ 37493-94, USNM 95121). REPÚBLICA DOMINICANA. *Pedernales Prov.*: 19 km N Pedernales, 1000 feet (305 meters), 1 (ASFS V2702); Las Mercedes, ca. 1400 feet (427 meters), 1 (ASFS V2659); 1 km S Los Arroyos, 4100 feet (1251 meters), 1 (ASFS V2605); 27 km N Puerto de Alcoa, 1 (ASFS X9765). *Independencia Prov.*: Aguacate, 3 (MCZ 58467-69); 8 km E Aguacate, 1600 feet (488 meters), 1 (ASFS X9945); 7.6 km NW La Descubierta, ca. 2000 feet (610 meters), 2 (ASFS V4375-76); Guayabal, 6 km N Postrer Río, 4 (MCZ 58470-73). *San Rafael Prov.*: 18 km SW Hondo Valle, 6000 feet (1830 meters), 1 (ASFS V360); 9.0 mi. (14.4 km) NW Elías Piña, 1 (ASFS V330); Rancho La Guardia, 13 (MCZ 58441-53); Pedro Santana, 1 (MCZ 58440); Bánica, 1 (MCZ 58438); 3 km E Bánica, 1 (MCZ 58439); 3 km NE Bánica, 13 (MCZ 58454-66). *San Juan Prov.*: San Juan, western edge, 6 (ASFS V499-504); 15 km SE San Juan, 4 (ASFS V487-90); 3 km E Las Matas, 4 (ASFS V305-08); Río Arriba del Norte, 1950 feet (595 meters), 3 (ASFS V521-23); 7 km N Carpintero, 9 (MCZ 58500-08); 7 km NW Vallejuelo, 2600 feet (793 meters), 3 (ASFS V302, ASFS V394-95). *La Vega Prov.*: Jarabacoa, 2 (MCZ 58480-81); 3 km NE Jarabacoa, 1 (ASFS V1948). *Sánchez Ramírez Prov.*: 12.3 km E Cotuí, 5 (ASFS V611-15). *San Cristóbal Prov.*: 10 km NE Gonzalo, 600 feet (183 meters), 2 (ASFS V3131-32). *Samaná Prov.*: south side of Río Yuna, approximately 1 km upstream from mouth, 7 (ASFS V2961-67). *María Trinidad Sánchez Prov.*: 11.2 km S Cabrera, 3 (ASFS

V4244-46). *Duarte Prov.*: 1 km NW Arenoso, 3 (ASFS V1841-43). *Espaillet Prov.*: 2 km N Puesto Grande, 2200 feet (671 meters), 2 (ASFS V1962-63). *Puerto Plata Prov.*: Puerto Plata, 2 (MCZ 5442, MCZ 43670); Sosúa, 8 (ASFS V1631-32, MCZ 13754-59); 6 km E Imbert, 700 feet (214 meters), 2 (ASFS V1691-92). *Santiago Prov.*: Santiago, 1 (MCZ 58482); Licey al Medio, 4 (MCZ 58317-20); Ceboruco (not mapped), 12 (MCZ 58483-94); 3 km S Pena (not mapped), 5 (MCZ 58495-99); 6 km E El Rubio, 1000 feet (305 meters), 2 (ASFS V2922-23); 7 km SE El Rubio, 2300 feet (702 meters), 1 (ASFS V2924). *Valverde Prov.*: 7 km E Valverde, 2 (ASFS V2954-55). *Monte Cristi Prov.*: 24 km E Monte Cristi, 1 (MCZ 43681); 4 km E Pepillo Salcedo, 1 (ASFS V1167); 2 km NE Palo Verde, 10 (ASFS V1303-12); 1 km S Palo Verde, 4 (ASFS V1357-60). *Dajabón Prov.*: 6 km S Copey, 1 (ASFS V1170); 1 km S Loma de Cabrera, 900 feet (275 meters), 1 (ASFS V1171).

Anolis distichus ignigularis Mertens

Anolis distichus ignigularis Mertens, 1939, *Abh. Senckenberg. Naturf. Ges.*, 449:58.

Type locality: San Pedro de Macorís, San Pedro de Macorís Province, República Dominicana.

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 55 mm, females to 44 mm snout-vent length), dorsum usually green anteriorly and rich and translucent reddish tan posteriorly (but capable of turning completely brown), dewlap vivid orange centrally with a narrow yellow margin, modally 0/0 scales between the supraorbital semicircles and the interparietal, 1/2 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and low mean number (3.5) of median zygous head scales.

Distribution: The República Dominicana from eastern San Cristóbal Province in the west, east along the coast to the type

locality, thence inland to the vicinity of Higüey and to the north coast (east of Miches) in La Romana Province; along the north coast to the Bahía de San Lorenzo in El Seibo Province, south into eastern San Cristóbal Province (Bayaguana), and west into the Cordillera Central; Península de Samaná, west to the vicinity of Yayaes (Fig. 3).

Comments: The dewlap and dorsal colors of *A. d. ignigularis* are very constant throughout the range of the subspecies. The vivid and extensive orange center and narrow yellow margin of the dewlap (Pl. 1) are diagnostic features of *ignigularis* in the eastern and central portions of the República Dominicana. The dorsum is usually a rather dark green anteriorly, grading rapidly into a translucent reddish tan posteriorly. The lizards can become completely brown, although this brown is of a more reddish shade (cinnamon) than that of *A. d. dominicensis*. The extent of the orange center of the dewlap is slightly variable, but the bright pigment is never restricted to a small and indistinct orange blush, as it is occasionally in *dominicensis*.

Scale data on the series of 103 *A. d. ignigularis* are: snout scales 4 to 8 (mode 4), loreal rows 3 to 6 (mode 5); supraorbital semicircles always in contact; modally 0/0 scales between the semicircles and the interparietal and 1/2 supraorbitals in contact with the interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 14 to 22 (mode 20); median azygous head scales 1 to 9 (mode 3, but 4 scales are almost equally as common, mean 3.5); "preoccipital" usually present (100 of 103 lizards); postmentals 4 to 10 (mode 5 or 6, mean 6.0). The asymmetrical mode of 1/2 supraorbitals in contact with the interparietal is peculiar, but the mode is fairly strong (34 individuals; next highest category is 0/0 with 26 lizards). Judging from the high incidence (26) of 1/1 supraorbitals in contact with the interparietal, I suspect that *ignigularis* is a population which is in the process of evolving

from a mode of 1/1 to 2/2 but has not completed the transition.

The largest males have snout-vent lengths of 55 mm, and both are from the vicinity of Higüey; the status of that particular population is probably intergradient between *ignigularis* and the race next to the southeast, but these two large males are clearly much more like *ignigularis* than the drab southern form. The largest female *ignigularis* has a snout-vent length of 44 mm; this individual, from the Valle de Culata, at an elevation of 5000 feet (1525 meters) in the Cordillera Central, is from an area of extreme intergradation with *dominicensis*.

A. d. ignigularis is readily separable from all previously discussed subspecies; the combination of orange dewlap and bicolor dorsum occurs in no other form. Comparison with the three orange-dewlapped Bahaman subspecies, *biminiensis*, *distichoides*, and *dapsilis*, is easily made. Aside from these three races lacking the bicolored dorsum, all are smaller, have much higher median head scale means (5.5 to 8.7 in contrast to 3.5 in *ignigularis*), lower means of postmentals (4.6 to 5.2 in contrast to 6.0), and have a high percentage of specimens which lack the "preoccipital." Of the three Bahaman subspecies, only *dapsilis* modally has 0/0 scales between the supraorbitals and the interparietal and 1/2 supraorbitals in contact with the interparietal as does *ignigularis*. In *dapsilis*, however, 1/2 is one of two bimodes. Extended comparisons with *dominicensis* are not necessary; the dewlap and dorsal colorations are sufficient to distinguish the two races. The 1/1 scales between the semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal in *dominicensis* differ from the conditions of 0/0 and 1/2 in *ignigularis*.

The apparently disjunct range of *ignigularis* is of especial interest. Were it not for the series (seven specimens) from the mouth of the Río Yuna, I would consider that *ignigularis* has a continuous dis-

tribution about the western end of the Bahía de Samaná. However, the Río Yuna lizards are clearly *dominicensis* and have the pale yellow dewlaps of that subspecies. Although there is evidence (Cochran, 1941:2) that the Península de Samaná was in historic time an island separated from the mainland, this seems hardly likely when the isthmus is visited today, since, although it is low-lying and swampy and is bisected by the *canos de Gran Estero*, it is also heavily forested, and it seems doubtful that the Samaná has been completely severed from the mainland so recently. Doubtless the Península has been completely insular at various times in the past. It seems possible that *ignigularis* invaded the Samaná across the Bahía de Samaná from the south, while the former was cut off from the balance of Hispaniola, and became established there, rather than having reached the Península around the western end of the Bahía. Another possibility is that *dominicensis* has followed down the Río Yuna from the interior and has invaded the area at the head of the bay, thereby severing the two components of the *ignigularis* population. Larger numbers of specimens from this immediate area may demonstrate intergradation; the series at hand from the mouth of the Río Yuna, however, does not show it.

Intergradation between *ignigularis* and *dominicensis* occurs in the eastern Cordillera Central, although specimens from the foot of the eastern escarpment of the Cordillera (vicinity of Monseñor Nouel) are clearly *ignigularis*. Specimens from the area about Constanza and Paso Bajito are much like *ignigularis*, except that the dewlap orange is somewhat paler (although usually very extensive), and the dorsum is more regularly all green rather than sharply bicolor. These specimens I regard as closer to *ignigularis* and have so listed them below.

A. d. ignigularis comes into contact with two other subspecies, that to the south and east in the La Romana to Cabo Engaño

region, and that to the southwest in the Llanos de Azua. No intergrades are known for the latter contact, and the break between the two subspecies must be rather sharp (see comments below). The four lots of fresh material from the vicinity of Higüey and Bejucal are much closer to *ignigularis* than to the subspecies to the south, although the series from 2 miles south of Higüey has one male with a yellow dewlap without any orange. Taken as a whole, the Higüey and Bejucal material is close to *ignigularis*. In two other areas, the intergrades between these two forms are closer to the unnamed subspecies and will be discussed below.

Like *A. d. dominicensis*, *ignigularis* has a wide altitudinal range, from sea level to elevations of at least 6000 feet (1830 meters) in the Cordillera Central. In the lowlands, it is a customary denizen of moist, shady cacao groves and other wooded situations. In the Cordillera it is encountered most frequently in heavily wooded ravines and local stands of rain forest, although at Valle de Culata it was found on a rail fence in an exposed and abandoned pasture. It does not occur commonly in the pine woods in the highlands.

Specimens examined: REPÚBLICA DOMINICANA. *San Cristóbal Prov.*: 15.5 km SE El Cacao, 1400 feet (427 meters), 1 (ASFS V2463); El Tablazo, nr. Río Nigua, 15 km NW San Cristóbal, 7 (MCZ 58714-20); La Cabirma de la Loma, northwest of San Cristóbal, 4 (MCZ 79269-72); Colonia Ramfis (= La Cabirma de la Loma), 5 (MCZ 58721-22, MCZ 58566-68); 1 km NW Colonia Ramfis (not mapped), 5 (MCZ 58561-65); 3 km SE Colonia Ramfis (not mapped), 7 (MCZ 58569-75); 6 km SE Colonia Ramfis (not mapped), 4 (MCZ 58576-79); 9 km SE Colonia Ramfis (not mapped), 5 (MCZ 58580-84); 12 km SE Colonia Ramfis, 5 (MCZ 58585-89); 15 km SE Colonia Ramfis (not mapped), 3 (MCZ 58590-92); 7 km N San Cristóbal, 6 (MCZ 58593-98); Mt. Calabozo, near San Cristóbal (not mapped), 3 (MCZ 58599-601); 2 mi.

(3.2 km) SE San Cristóbal, 2 (ASFS X7774-75); 3 km W Bayaguana, 4 (ASFS V602-06); 10 km NE Bayaguana, 1 (ASFS V3141); Comate, Municipio Bayaguana, 5 (MCZ 79286-90); Monte Plata, 1 (MCZ 16441). *Distrito Nacional*: 9.8 mi. (15.7 km) E Santo Domingo, 5 (ASFS X7735-39); Santo Domingo, 8 (MCZ 53945, MCZ 58655, MCZ 58708, MCZ 75185-86, MCZ 79266-68). *San Pedro de Macorís Prov.*: 6 km N San Pedro de Macorís, 2 (ASFS X7832-33). *La Romana Prov.*: Bejucal, 5 (MCZ 58602-06); 1 mi. (1.6 km) NE Higüey, 5 (ASFS V771-75); 2 mi. (3.2 km) S Higüey, 4 (ASFS V747-50); 6.6 km W, Higüey, 1 (ASFS V1013); 24.8 mi. (39.7 km) ESE Miches, 2 (ASFS X7891-92). *El Seibo Prov.*: 1.4 mi. (2.2 km) SE Miches, 1 (ASFS X9349); 14 km SW Miches, 8 (MCZ 75187-94); 6.6 mi. (10.6 km) NW Hato Mayor, 2 (ASFS X7871-72); San Francisco, 6 km SE Hato Mayor, 1 (MCZ 58614); 2.1 mi. (3.4 km) N El Valle, 2 (ASFS X7866-67); Sabana de la Mar, 42 (ASFS V3081-98, MCZ 58615-38); 3.5 mi. (5.6 km) S Sabana de la Mar, 7 (ASFS X7841-44, ASFS X7930-32); 20 km S Sabana de la Mar, 11 (MCZ 58639-49); Cueva de Caño Hondo, 5 (ASFS X9284-88); Bahía de San Lorenzo (small beach west of railway bed), 2 (ASFS V3150-51). *La Vega Prov.*: Paso Bajito, 1 (ASFS X8787); 7 km E Paso Bajito, Casa de los Michelenas, 3 (ASFS X8781-83); El Río, 6 (MCZ 64371-76); 7.1 mi. (11.4 km) E El Río, 3500 feet (1068 meters), 1 (ASFS X8112); Constanza, 9 (MCZ 44387, MCZ 58652-54, MCZ 58709-13); 9.1 mi. (14.6 km) N Constanza, 6000 feet (1830 meters), 3 (ASFS X8487, ASFS X8700-01); 9 km N Constanza, 1 (ASFS X8699); 5.1 mi. (8.2 km) N Constanza, Valle de Culata, 5000 feet (1525 meters), 11 (ASFS X8488-98); 6 km W Constanza, 4250 feet (1296 meters), 2 (ASFS X8832-33); Loma Vieja, 1 (MCZ 44383); Paraje La Palma, Municipio Constanza (not mapped), 41 (MCZ 75153-79, MCZ 79273-85); El Convento, Municipio Constanza (not mapped), 5 (MCZ 79291-95); El Montazo, Municipio Constanza (not

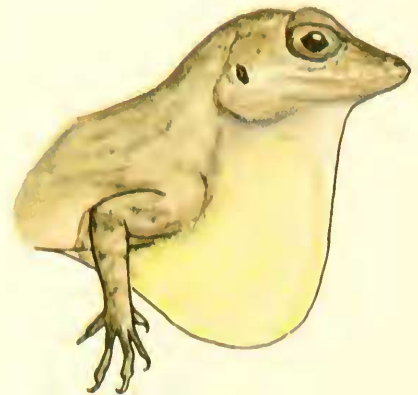
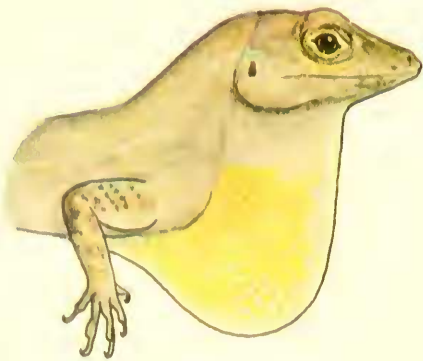
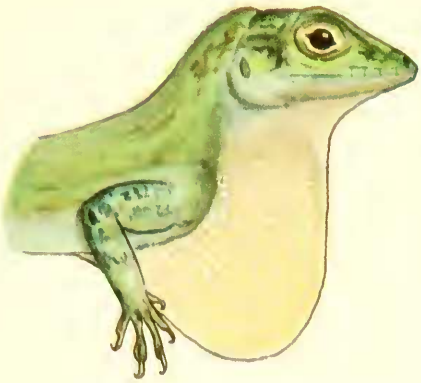
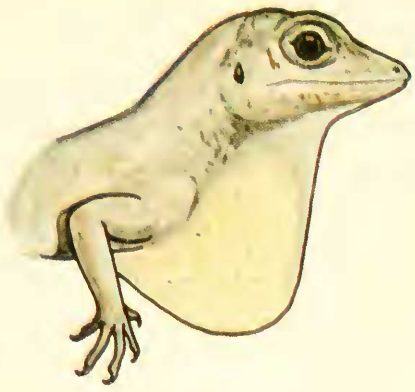
mapped), 1 (MCZ 79296); Sección La Culata, Paraje La Ciénaga, 1 (MCZ 75180); Municipio Jarabacoa, Sección Manabao, Paraje la Ciénaga, 3 (MCZ 75181-83); between Constanza and Jarabacoa (not mapped), 5 (MCZ 64383-87); Loma Rucilla, 3 (MCZ 44384-86); Monseñor Nouel, 1 (MCZ 64370); 1.2 mi. (1.9 km) SE Monseñor Nouel, 700 feet (214 meters), 1 (ASFS X8125); Piedra Blanca, 6 (MCZ 64377-82); 2 km NW La Cumbre, 2 (MCZ 56850-51). *Samaná Prov.*: 8 km SE Yayales, 1 (ASFS V1918); 6 km E Sánchez, 2 (ASFS V1908-09); Sánchez, 11 (MCZ 37497-506 + one untagged specimen); 5 km W Samaná, 1 (ASFS V1983); Samaná, 2 (MCZ 5448, MCZ 43699); Puerto Escondido, 4 (ASFS V2974-77).

*Anolis distichus properus*⁵ subsp. n.

Holotype: MCZ 81130, an adult male, from 0.5 mi. (0.8 km) NW Boca de Yuma, La Romana Province, República Dominicana, taken 31 August 1963 by Ronald F. Klinikowski. Original number V920.

Paratypes (all from La Romana Province, República Dominicana): ASFS V921, same data as holotype; ASFS X8235, Río Cumayasa, 17 km W La Romana, 28 June 1963, D. C. Leber; MCZ 16443-51, La Romana, 1922, E. Lieder; MCZ 75203, MCZ 75205-06, La Romana, 27 March 1963, C. E. Ray, R. Allen; MCZ 75184, MCZ 75195-97, 5 km E La Romana, 27 March 1963, C. E. Ray, R. Allen; USNM 157917, 8 km E La Romana, 19 July 1963, R. Thomas; ASFS X9316, 2 km E La Romana, 19 July 1963, R. Thomas; ASFS V1062-63, mouth of Río Chavón, west side, 4 September 1963, R. F. Klinikowski; MCZ 58607, MCZ 58609-13, Sanate, 12 km S Higüey, 26 August 1958, C. E. Ray and A. S. Rand; AMNH 96472-75, 0.3 mi. (0.5 km) NW Boca de Yuma, 29 August 1963, A. Schwartz, R. Thomas; ASFS V1135, 2.5 km NW Boca de Yuma, 4 September 1963, native collector; RT 807, 2.5 km NW Boca

⁵ From Latin, *properus*, quick.



Page 1

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data. The second part of the document provides a detailed breakdown of the financial data for the quarter. It includes a table showing the revenue generated from various sources, as well as the associated costs and expenses. The final part of the document concludes with a summary of the overall financial performance and offers recommendations for future improvements. It suggests that by implementing more rigorous record-keeping practices, the organization can better manage its resources and increase its profitability.



Plate I

First row: left, *A. distichus distichus* (ASFS 10301), Cave Point, New Providence Island, Bahama Islands, snout-vent length 46 mm; right, *Anolis d. distichooides* (ASFS 10280), Fresh Creek, Andros Island, Bahama Islands, snout-vent length 46 mm.

Second row: left, *A. d. biminiensis* (ASFS X4932), western end, South Bimini Island, Bahama Islands, snout-vent length 47 mm; right, *Anolis d. ocior* (MCZ 81140), Port Nelson, Rum Cay, Bahama Islands, snout-vent length 53 mm.

Third row: left, *A. d. dominicensis* (ASFS X1237), Morne Calvaire, 1 mi. SW Pétionville, 2300 feet, Dépt. de l'Ouest, Haiti, snout-vent length 54 mm; right, *A. d. ignigularis* (ASFS X7735), 9.8 mi. E Santo Domingo, Distrito Nacional, República Dominicana, snout-vent length 48 mm.

Fourth row: left, *A. d. properus* (MCZ 81130), 0.5 mi. NW Boca de Yuma, La Romana Province, República Dominicana, snout-vent length 48 mm; right, *A. d. sejunctus* (MCZ 81131), environs of Mano Juan, Isla Saona, República Dominicana, snout-vent length 50 mm.

The image displays four specimens of the genus *Anolis*, specifically *Anolis dromedarius*, arranged in a 2x2 grid. Each specimen is shown in a dorsal view, highlighting the characteristic hump on its back and the coloration of its body. The specimens vary in size and coloration, reflecting different subspecies and their geographic origins. The background is a plain, light color, which makes the specimens stand out.

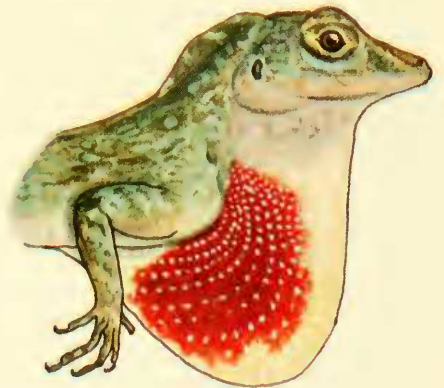
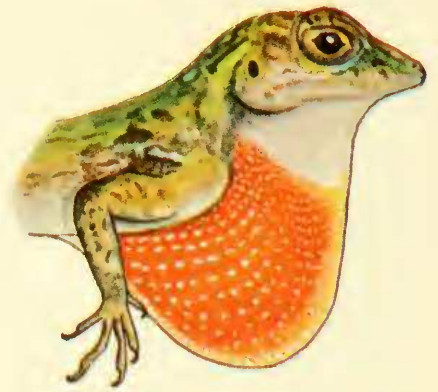
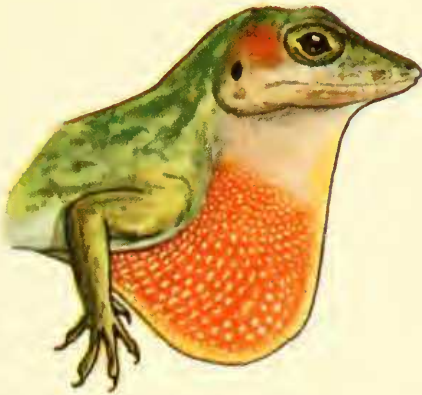
Plate II

First row: left, *A. d. tostus* (MCZ 81134), western end, Isla Catalina, República Dominicana, snout-vent length 49 mm; right, *A. d. ravitergum* (MCZ 81132), 16.5 mi. S San Jose de Ocoa, Peravia Province, República Dominicana, snout-vent length 53 mm.

Second row: left, *A. d. favillarum* (MCZ 81133), 3 km NE Las Auyamas, 3300 feet, Barahona Province, República Dominicana, snout-vent length 50 mm; right, *A. d. aurifer* (MCZ 81135), 11 km N Cavaillon, 1300 feet, Dépt. du Sud, Haiti, snout-vent length 52 mm.

Third row: left, *A. d. vinosus* (MCZ 81136), Camp Perrin, Dépt. du Sud, Haiti, snout-vent length 53 mm; right, *A. d. juliae* (ASFS X3548), western end, Ile-à-Vache, Haiti, snout-vent length 48 mm.

Fourth row: left, *A. d. suppar* (MCZ 81137), Dame-Marie, south side of town along coast, Dépt. du Sud, Haiti, snout-vent length 52 mm; right, *A. d. patruelis* (MCZ 81138), vicinity of Pointe Sable, Ile Grande Cayemite, Haiti, snout-vent length 49 mm.



de Yuma, 6 August 1963, native collector; MCZ 75198-202, Boca de Yuma, 28 March 1963, C. E. Ray, R. Allen; MCZ 75207-21, Juanillo, 29 March 1963, C. E. Ray, R. Allen; UIMNH 61681-83, 16.5 km SE El Macao, 31 August 1963, R. F. Klinikowski, R. Thomas.

Intergrades between *A. d. ignigularis* and *A. d. properus* (but closer to the latter): República Dominicana, La Romana Province: 12 km NE La Romana, 2 (ASFS X9319-20); 0.7 mi. (1.1 km) SE El Macao, 3 (ASFS X7879-81).

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 54 mm, females to 45 mm snout-vent length), dorsum plain ashy to very pale green (rarely) and without any distinct dark markings on the head, dewlap very pale yellow with at times a pale central orange blush, modally 0/0 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and very low mean number (2.8) of median azygous head scales.

Distribution: La Romana Province, República Dominicana, from the Río Cumayasa on the west, east and north around Cabo Engaño to the vicinity of El Macao; intergrades with *A. d. ignigularis* northeast of La Romana, south of Higüey, and at El Macao (Fig. 3).

Comments: The pale and drab *A. d. properus* stands in strong contrast to its brightly colored relative *ignigularis* to the north and west. The two are readily separable on the basis of body color, since *properus* is always faded and pale and usually ashy gray in the field, although it is capable of a very pale green phase. No specimens were observed to become solid dark brown, one of the phases in the repertory of *ignigularis*. The pale yellow dewlap of *properus* is in harmony with the balance of its faded coloration (Pl. I); occasional specimens have a pale orange central blush on the dewlap. In dewlap

color, *properus* resembles *dominicensis* (from whose range it is separated by *ignigularis* and an undescribed subspecies), but it can be differentiated from *dominicensis* by the lack of bright green and dark brown phases. The head is virtually patternless, and this character will differentiate *properus* from the unnamed subspecies to the west in the Valle de Neiba and Llanos de Azua. The hindlimb banding, which is a fairly constant feature of *dominicensis* and *ignigularis*, is much reduced or absent in *properus*.

The holotype has the following measurements and counts: snout-vent length 48 mm, tail ca. 57 mm, tail regenerated; 5 scales across snout, 4 loreal rows, semicircles in contact, 0/0 scales between supraorbital semicircles and interparietal, 1/1 supraorbitals in contact with interparietal, 3/3 scales in lateral contact with postfrontals, 19 fourth toe lamellae, 3 median azygous head scales, "preoccipital" present, 7 postmentals.

Scale counts for the series of 58 *A. d. properus* are: snout scales 4 to 9 (mode 4 but 6 scales is almost equally modal), loreal rows 4 to 6 (mode 5); supraorbital semicircles in contact in all specimens; modally 0/0 scales between supraorbital semicircles and interparietal, and 0/0 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with prefrontals; fourth toe lamellae 15 to 21 (mode 17); median azygous head scales 1 to 6 (mode 3, mean 2.8); "preoccipital" usually present (55 of 58 specimens); postmentals 4 to 11 (mode 6, mean 6.7). The largest male (54 mm snout-vent length) is from La Romana, and the largest female (45 mm) is from 2.5 km NW Boca de Yuma.

Intergradient specimens between *properus* and *ignigularis* from south of Higüey and Bejucal have already been noted under the discussion of the latter subspecies. The Higüey material was collected on fence posts in a shady pasture; in life these lizards were olive to gray with more or less longitudinal dark striae (which *properus*

lacks). One specimen had a dirty yellow dewlap, whereas in the remainder of the series the dewlaps had variable amounts of orange centrally and pale yellow edges. These lizards are appropriate both geographically and in characteristics as intermediates between *properus* and *ignigularis*, but as a whole they are closer to the latter. The Bejueal series, which I did not see in life, at least shows dorsal pattern features which are likewise more like those of *ignigularis* than *properus*.

The specimen from 0.7 mi. (1.1 km) SE El Macao has the dorsum tan and striated. The dewlap has a restricted patch of dull orange basally and a wide pale yellow margin. This specimen, by virtue of its striate dorsum and more prominent orange dewlap blotch, seems intermediate between *properus* and *ignigularis*, although much closer to the former. Specimens of *ignigularis* were taken about 30 kilometers northwest of El Macao.

The remaining locality for *ignigularis* × *properus* intergrades is 12 km NE La Romana. The situation at this locality is most peculiar, since the two specimens were collected in a mesic and forested ravine which presently cuts deeply through cane fields. The dewlap of the single male was dull orange centrally with a narrow dull yellow edge—an *ignigularis* character. The dorsal color was dull grayish to dull greenish; the back was not bicolor and the hues were much subdued and faded, but not so pale as those of *properus*. These specimens combine the characters of *properus* and *ignigularis*.

Comparisons of *properus* with both *dominicensis* and *ignigularis* have been made above. Of the Bahaman subspecies, *properus* most closely resembles *distichus*; from *himiensis*, *distichoides* and *dapsilis*, *properus* differs in having a yellow rather than an orange dewlap, as well as in several scale characters, the most striking of which is the extremely low mean for median head scales (2.8 in contrast to 5.5 to 8.7 in the above listed Bahaman subspecies). *A. d.*

ocior in its non-green phase is somewhat like *properus*, but the longitudinally lined flanks will distinguish the former from the latter, as will also the median head scales (5.8 in *ocior*). From the nominate race, which *properus* most closely resembles in general aspect and dewlap color, *properus* differs in lower mean median head scales (2.8 versus 5.9), greater number of postmentals (6.7 versus 5.4), larger size (54 mm versus 49 mm), and in never having the supraorbital semicircles separated by a row of scales. *A. d. distichus* and *A. d. properus* both have 0 0 scales between the semicircles and the interparietal and 0 0 supraorbitals in contact with the interparietal as the modal conditions.

The range of *A. d. properus* embraces the arid portion of extreme eastern Hispaniola. Lizards were taken on fences and in xeric woods and on rocks with which their color blends exceptionally well. Although I have no data on elevation, there are no high mountains in this southeastern region, and thus no specimens come from elevations of any consequence. The type locality lies on the forested limestone ridge which parallels the coast at Boca de Yuma. At Boca de Chavón, *A. d. properus* was collected in coastal stands of *Coccoloba*. Nowhere does the subspecies appear to be so abundant as *ignigularis* and *dominicensis*.

*Anolis distichus sejunctus*⁶ subsp. n.

Holotype: MCZ 81131, an adult male, from environs of Mano Juan, Isla Saona, República Dominicana, taken 19 July 1964 by Richard Thomas. Original number V3064.

Paratypes: ASFS V3061–63, AMNH 96476, USNM 157918, same data as holotype.

Definition: A subspecies of *A. distichus* characterized by small size (males to 50 mm snout-vent length; only one female known, with snout-vent length of 38 mm),

⁶ From Latin, *sejungere*, to sever.

dorsum light gray with darker spots and flecks and suffused with greenish yellow, head without any distinct dark markings, dewlap uniform pale yellow, modally 1/1 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and moderate mean number (4.3) of median azygous head scales.

Distribution: Isla Saona, República Dominicana (Fig. 3).

Comments: The five males and one female taken on Isla Saona are the only specimens of *A. distichus* known from that island. The dorsum is light gray and (in large males) is suffused with greenish yellow. Thus, *sejunctus* seems to have both a gray and a greenish color phase in its repertory. In both phases, the dorsum is marked with a scattering of dark spots and flecks, although the head lacks any definitive pattern. The dewlap is regularly faint yellow (Pl. 1). The holotype has the following measurements and scale counts: snout-vent length 50 mm, tail 37 mm, two thirds regenerated; 7 scales across snout, 5 loreal rows, semicircles in contact, 0/0 scales between semicircles and interparietal, 1/1 supraorbitals in contact with interparietal, 2/3 scales in lateral contact with postfrontals, 18 fourth toe lamellae, 3 median azygous head scales, "preoccipital" present, 5 postmentals. The series of six *A. d. sejunctus* has the following scale counts: snout scales 5 to 7 (mode 5), loreal rows 4 to 6 (mode 5); supraorbital semicircles in contact in all specimens; modally 1/1 scales between supraorbital semicircles and interparietal and 0/0 supraorbitals in contact with interparietal; 2/2 and 3/3 (each with two specimens) scales in lateral contact with postfrontals; fourth toe lamellae 15 to 18 (mode 18); median azygous head scales 3 to 6 (mode 3 or 5, both with two lizards, mean 4.3); "preoccipital" always present; postmentals 5 to 7 (mode 5, mean 5.7).

A. d. sejunctus resembles *A. d. properus* on the adjacent mainland. Two features distinguish them: the absence in *properus* of any dorsal markings, with a consequently plain back, and the greenish tints which *sejunctus* is apparently able to assume regularly. *A. d. properus* only very rarely has any green hues in its repertory. The two races resemble each other in lacking any dark head pattern, and in having a uniform pale yellow dewlap (although *properus* may have a pale basal orange blush). Scalewise, *properus* modally has 0/0 scales between the semicircles and the interparietal, whereas *sejunctus* has a formula of 1/1. In mean of median head scales, *properus* (2.8) is lower than *sejunctus* (4.3).

From the balance of the subspecies, *sejunctus* differs from *distichoides*, *biminiensis*, *dapsilis*, and *ignigularis* in having a yellow rather than an orange dewlap. From the yellow-dewlapped forms *distichus* and *ocior*, *sejunctus* differs in having 1/1 scales between the semicircles and the interparietal (0/0 in the two Bahaman subspecies) and 0/0 supraorbitals in contact with the interparietal (0/0 in *distichus*, 1/1 in *ocior*). *A. d. distichus* is incapable of a green phase, and the lineate sides and unpatterned back of *ocior* contrast with the patterned back and plain sides of *sejunctus*. The usual differences in presence of the "preoccipital" and higher frequency of complete separation of semicircles in Bahaman versus Hispaniolan races apply as well. Compared with the yellow dewlapped *A. d. dominicensis* to the west, *sejunctus* differs in smaller size, flecked and spotted in contrast to striate dorsum, and lower mean number of postmentals (5.7 versus 6.6). The aspect of these two subspecies is quite different.

The area about Mano Juan is generally shady woody scrub, and the lizards were taken in this habitat as well as in the settlement of Mano Juan.

The fauna of Isla Saona is becoming in-

creasingly well known, and all species which occur there which have been studied (*Leiocephalus lunatus*, *Ameiva chrysolaeama*, *Ameiva taeniura*, *Dromicus parvifrons*) are represented by distinctive subspecies, which show expected affinities with their relatives on the adjacent mainland or in extreme eastern Hispaniola. *A. distichus* follows this pattern. Presumably *A. d. sejunctus* is widespread on Saona, despite the fact that it is known only from the area about Mano Juan.

*Anolis distichus tostus*⁷ subsp. n.

Holotype: MCZ 81134, an adult male, from Isla Catalina, western end, República Dominicana, taken 20 August 1963 by Richard Thomas. Original number V558.

Paratypes: ASFS V559-60, same data as holotype.

Definition: A subspecies of *A. distichus* characterized by (presumably) small size (males to 46 mm snout-vent length; females unknown), dorsum yellow-tan with little or no flecking or striations and no head pattern, dewlap deep orange centrally with a yellow border, modally 0/0 scales between the supraorbital semicircles and the interparietal, and moderate mean number (5.0) of median azygous head scales.

Distribution: Isla Catalina, República Dominicana (Fig. 3).

Comments: The three male specimens of *A. d. tostus* are so distinctive that I have no hesitancy in describing them as a subspecies which differs both from *properus* on the adjacent coast and *sejunctus* on Isla Saona to the east. The yellow-tan dorsum (pl. 12 J 3) is like that of no other subspecies of *A. distichus*; the patternless head resembles that of both *sejunctus* and *properus*, but the extensively orange-centered dewlap (Pl. II) is more like that of *ignigularis* (which usually has the orange center larger and the yellow edge much narrower) than the pale yellow dewlaps of both *properus* and *sejunctus*. There is no evidence (but the

number of specimens both collected and observed was few) that *tostus* has a green phase or has green pigment in its repertory.

The holotype has the following measurements and counts: snout-vent length 46 mm, tail broken; 5 scales across snout, 5 loreal rows, semicircles in contact, 0/0 scales between semicircles and interparietal, 2/2 supraorbitals in contact with interparietal, 2/2 scales in lateral contact with postfrontals, 16 fourth toe lamellae, 5 median azygous head scales, "preoccipital" present but tiny, 4 postmentals. The series of three *A. d. tostus* has the following scale counts: snout scales 5 and 6 (mode 6), loreal rows 4 and 5 (mode 4); supraorbital semicircles in contact in all specimens; modally 0/0 scales between supraorbital semicircles and interparietal; no mode for number of supraorbitals in contact with interparietal—counts of 1/1, 2/0, 2/2; no mode for number of scales in lateral contact with postfrontals—counts of 2/2, 2/3, 3/3; fourth toe lamellae 16 to 19 (mode 16); median azygous head scales 4 to 6 (no mode; mean 5.0); "preoccipital" always present; postmentals 3 and 4 (mode 4, mean 3.7). The mean of median head scales is the highest for any Hispaniolan population; the small sample of *tostus* renders the significance of this high figure dubious.

From the subspecies *distichus*, *ocior*, *dominicensis*, *properus*, and *sejunctus*, *A. d. tostus* differs in having a yellow-tan dorsum and a dewlap with a deep orange center and a broad yellow edge. It resembles the races *biminiensis*, *distichoides*, *dapsilis*, and *ignigularis* in having an orange dewlap, but differs from these races in dorsal color and pattern. Scale counts are not profitably compared.

On Isla Catalina, *A. d. tostus* was collected exclusively in dry hammock woods (= low coppice), and even there was uncommon. Since Isla Catalina is very dry and much of it is sun-baked scrub and grassland, presumably *tostus* is restricted to the shadier situations in xeric woods.

⁷ From Latin, *torrere*, to parch.

Anolis distichus ravitergum^s subsp. n.

Holotype: MCZ 81132, an adult male, from 16.5 mi. (26.4 km) S San José de Ocoa, 500 feet (122 meters). Peravia Province, República Dominicana, one of a series taken 24 August 1963 by Ronald F. Klinikowski, Albert Schwartz, and Richard Thomas. Original number V728.

Paratypes (all from the República Dominicana): ASFS V729-35, same data as holotype; ASFS X7988, 1.8 mi. (2.9 km) W, thence 1.1 mi. (1.8 km) N Azua, Azua Province, 24 June 1963, R. Thomas; AMNH 96477-80, CM 40604-08, 1.8 mi. (2.9 km) W, thence 2.7 mi. (4.3 km) N Azua, Azua Province, 24 June 1963, R. F. Klinikowski, D. C. Leber; MCZ 58422-23, 12 km N Azua, Azua Province, 11 August 1958, C. E. Ray, A. S. Rand; ASFS V3169-77, 2 km W Puerto Viejo, Azua Province, 27 July 1964, D. C. Leber, R. Thomas; UIMNH 61684-85, 15.2 mi. (24.3 km) S San José de Ocoa, Peravia Province, 24 August 1963, A. Schwartz; UF FSM 21514-15, 1.8 mi. (2.9 km) S San José de Ocoa, 1300 feet (397 meters), Peravia Province, 24 August 1963, R. F. Klinikowski, R. Thomas; USNM 157919-25, 10 km W Baní, Peravia Province, 27 July 1964, D. C. Leber, R. Thomas; MCZ 58421, 13 km NW Baní, Peravia Province, 6 August 1958, C. E. Ray, A. S. Rand; KU 93359-64, 4.2 mi. (6.7 km) NE Sabana Grande de Palenque, San Cristóbal Province, 27 June 1963, A. Schwartz.

Referred specimens: REPÚBLICA DOMINICANA. *Independencia Prov.*: 6.3 mi. (10.1 km) SW Neiba, 3 (ASFS V269-71). *Baoruco Prov.*: 3.9 mi. (6.2 km) ENE Neiba, 4 (ASFS V221-24); 3.4 mi. (5.4 km) ENE Neiba, 1 (ASFS V246); 0.8 mi. (1.3 km) SW Neiba, 4 (ASFS V248-50, RT 774).

Intergrades between *A. d. ravitergum* and *A. d. dominicensis*: REPÚBLICA DOMINICANA. *Azua Prov.*: Padre las Casas, 3 (MCZ 58477-79).

Definition: A subspecies of *A. distichus*

characterized by large size (males to 56 mm, females to 45 mm snout-vent length), dorsum ashy gray to tan or pale greenish, head usually with a distinct interocular dark brown bar and a dark U extending from the eyes across the occiput, dewlap pale yellow, at times with a faintly orange center, modally 0/0 scales between the supraorbital semicircles and the interparietal and 1/1 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and a very low mean number (2.6) of median azygous head scales.

Distribution: The Valle de Neiba and the Llanos de Azua, from east of Lago Enriquillo east to the vicinity of Sabana Grande de Palenque in San Cristóbal Province, República Dominicana (Fig. 3).

Comments: *A. d. ravitergum* is typically an ashy gray to drab tan lizard with a fairly prominent brown head pattern. Some individuals show a greenish phase, but the green is neither bright nor vivid. The dewlap is pale yellow and occasionally has a pale orange center (Pl. II). Specimens with orange-centered dewlaps are commoner in the Valle de Neiba and may be demonstrating in this area the residual genetic influence of the subspecies in the uplands of the adjacent Sierra de Baoruco. The back is usually moderately marked with vague longitudinal striae, but some specimens are plain above. A few lizards (as preserved) lack the head markings described for the subspecies, but in general the markings are a consistent feature of the entire series. The venters are whitish and the undersides of the tails vary from pale yellow to orange or yellowish green. In general, the entire coloration is faded and subdued.

The holotype has the following measurements and counts: snout-vent length 53 mm, tail 56 mm, incomplete; 4 scales across snout, 5 loreal rows, semicircles in contact, 0/0 scales between supraorbital semicircles and interparietal, 1/2 supraorbitals in contact with interparietal, 2/2 scales in lateral

^s From Latin, *ratum*, gray, and *tergum*, back.

contact with postfrontals, 19 fourth toe lamellae, 2 median head scales, "preoccipital" present but divided longitudinally, 6 postmentals.

Scale counts for the series of 57 *ravitergum* are: snout scales 4 to 8 (mode 6), loreal rows 3 to 6 (mode 4); supraorbital semicircles in contact in all specimens; modally 0/0 scales between supraorbital semicircles and interparietal and 1/1 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 14 to 23 (mode 17); median azygous head scales 0 to 5 (mode 3, mean 2.6); "preoccipital" usually present (49 of 52 specimens); postmentals 4 to 9 (mode 5, mean 5.6). The largest males (56 mm) are from 3.9 mi. (6.2 km) ENE Neiba, Baoruco Province, and the largest female (45 mm) is from 12 km E Azua, Azua Province.

In having a yellow dewlap, *ravitergum* differs from the orange-dewlapped subspecies *biminiensis*, *distichoides*, *dapsilis*, *ignigularis* and *tostus*. *A. d. ravitergum* in its drab coloration is most like *properus* and *sejunctus*. The presence of a head pattern and of at least vague striae on the dorsum will distinguish *ravitergum* from these races. From *dominicensis*, *ravitergum* differs in dorsal coloration (lacking either a bright green or a dark brown phase), in having 0/0 scales between the semicircles and the interparietals and 1/1 supraorbitals in contact with the interparietal (1/1 and 0/0, respectively, in *dominicensis*), and lower mean number of median head scales (2.6 versus 3.9). *A. d. ravitergum* resembles *A. d. ocior* in general dorsal color, but the latter race has a prominent lateral pale streak, a brighter green phase, and much higher mean of median head scales (2.6 versus 5.8). *A. d. ravitergum* is the second largest subspecies, being exceeded in snout-vent length only by *A. d. dominicensis*. It is most closely approached by *ignigularis* and *properus* in size.

Presumably *A. d. ravitergum* comes into contact with three other subspecies of *A.*

distichus. To the west in the Valle de Neiba it must meet *dominicensis* somewhere between Neiba, on the one hand, and Aguacate and the mountains above La Descubierta, on the other. No specimens are available from this hiatus, and it is interesting that the lizards from both the latter localities are from the ascending slopes of the Sierra de Neiba (2000 feet—610 meters) and the Sierra de Baoruco (1600 feet—488 meters). Since *ravitergum* is in essence an inhabitant of the floor of the Valle de Neiba in the western portion of its range, the zone of intergradation may well be narrow and restricted to the lower slopes of the ranges. The nearest localities in the valley floor whence I have seen *A. d. dominicensis* to the west in Haiti are Manneville and Thomazeau; comment on the orange-dewlapped populations of *dominicensis* in the Thomazeau-Manneville region has already been made. It is pertinent to note again that the highest frequency of orange dewlap centers in *ravitergum* is in the Valle de Neiba east of the Thomazeau-Manneville area.

A short series of three specimens is from Padre las Casas, Azua Province, on the southern dry slopes of the Cordillera Central. These lizards, even though preserved for some time, still are noticeably green, especially about the head; the larger female has a snout-vent length of 47 mm, which is near the upper extreme of female *dominicensis* but below that of *ravitergum*. The general area about Padre las Casas is transitional between the lower arid Llanos de Azua and the more mesic interior uplands, but its aspect and fauna (i.e., *Ameiva lineolata*) are closer to those of the hot lowlands. I would expect on ecological grounds that the *A. distichus* at Padre las Casas would be *ravitergum*; geographically, however, it is an almost ideal situation for intergradation between a lowland and (in this area) highland subspecies.

A. d. ravitergum comes into contact in the east with *A. d. ignigularis*, in southwestern San Cristóbal Province. Here, the

line of demarcation between the two subspecies is extremely sharp, since *ravitergum* is known from 4.2 mi. (6.7 km) NE Sabana Grande de Palenque and *ignigularis* from 2 mi. (3.2 km) SE San Cristóbal and 15.5 km SE El Cacao at 1400 feet, as well as from a series of specimens from various measured localities along the road from San Cristóbal to El Cacao. The *ignigularis* localities are distinctly upland and mesic, although the locality southeast of San Cristóbal is in the mesic lowlands. The distance between the San Cristóbal and Sabana Grande localities is about 16 kilometers airline, but the situation near San Cristóbal (a shaded fence row adjacent to pasture in a generally mesic region) is in contrast to the drier coastal region near Sabana Grande. In general, this area in the vicinity of Baní is becoming increasingly well known as either a place where there is fairly rapid shift in subspecies or as the extreme limit of distribution of species, since on the west are the xeric Llanos de Azua and on the east the more mesic regions which extend toward Santo Domingo. The specimens which I have examined from this general region are referable to either *ravitergum* or *ignigularis*, and I do not regard any of them as intergradient.

There is presumably also a zone of contact between *ravitergum* and the undescribed subspecies in the Sierra de Baoruco, but there are no specimens from lower intermediate elevations, and all material at hand from the eastern Baoruco is clearly the race indigenous to that massif and shows no tendencies toward *ravitergum* (see however the discussion below concerning the material from southwest of Barahona in the Sierra de Baoruco).

Although *A. d. ravitergum* is essentially a lowland subspecies in the Valle de Neiba and the Llanos de Azua, it does ascend the southern rolling piedmont of the Cordillera Central in the vicinity of San José de Ocoa and also occurs in the Sierra de Ocoa. But in both these regions, conditions are xeric and merely continuations

of the same habitat in the lower plains. The highest elevation for *A. d. ravitergum* is 1300 feet (397 meters); presumably it also occurs below sea level at the eastern end of Lago Enriquillo.

The relationships of *A. d. ravitergum* and *A. brevirostris* in the Valle de Neiba will be discussed later in detail by Dr. Williams. It is pertinent at this time to point out that in this low and arid valley, *A. d. ravitergum* is more or less confined to shady palm oases and other less rigorous situations, whereas *A. brevirostris* is the lizard of the open scrub. On the ascending slopes of the Sierra de Baoruco, *A. distichus* and *A. brevirostris* are precisely syntopic; in this area of syntopy, the vegetational cover is intermediate between that of the rain forest above and the arid plains below.

*Anolis distichus favillarum*⁹ subsp. n.

Holotype: MCZ 81133, an adult male, from 3 km N Las Auyamas, 3300 feet (1007 meters) Barahona Province, República Dominicana, taken 24 July 1963 by David C. Leber. Original number X9593.

Paratypes (all from Barahona Province, República Dominicana): ASFS X9592, same data as holotype; ASFS X9838–41, 7.0 mi. (11.2 km) S Cabral, 2300 feet (702 meters), 27 July 1963, R. Thomas; CM 40609–12, 7.1 mi. (11.4 km) S Cabral, 2300 feet (702 meters), 27 July 1963, D. C. Leber, R. Thomas; ASFS X9832–33, 8.8 mi. (14.1 km) S Cabral, 2700 feet (824 meters), 27 July 1963, D. C. Leber, R. Thomas; MCZ 58424, MCZ 58426–28, MCZ 58430–31, MCZ 58433–35, MCZ 58437, La Cueva, 11 km SW Cabral, 17 August 1963, C. E. Ray, A. S. Rand; UF/FSM 21516, 8 km NE Las Auyamas, 2600 feet (793 meters), 28 July 1963, native collector; UF/FSM 21517, 24 km SW Barahona, 3700 feet (1129 meters), 2 August 1963, D. C. Leber; AMNH 96481–83, 24 km SW Barahona, 3700 feet (1129 meters), 6 July 1964, D. C.

⁹ From Latin, *favilla*, glowing ashes.

Leber, R. Thomas; MCZ 65353, Hermann's finca, near Paraíso, 2400 feet (732 meters), 26 August 1932, W. G. Hassler.

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 54 mm, females to 47 mm snout-vent length), dorsum bright dark green and heavily striate with darker green or brownish, head with rusty temples and interparietal scale yellow-green and sharply set off from remainder of green head coloration, dewlap vivid orange centrally with a narrow pale yellow edge, modally 1/1 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and a moderate mean number (3.8) of median azygous head scales.

Distribution: Known only from intermediate and higher elevations in the eastern portion of the Sierra de Baoruco in the República Dominicana (Fig. 3).

Comments: Perhaps the most gaudy of the Hispaniolan mainland races of *A. distichus* is *favillarum*. This is especially true when it is compared with its neighbors *dominicensis* in the west and *ravitergum* in the north. The latter is essentially a drab brownish lizard with a pale yellow dewlap and the former a green lizard with a pale yellow dewlap. Neither has the rusty temples and sharply distinct yellow-green interparietal scale nor the vivid orange *favillarum* dewlap (Pl. II).

The holotype of *A. d. favillarum* has the following measurements and counts: snout-vent length 50 mm, tail broken; 4 scales across snout, 4 loreal rows, semicircles in contact, 0/0 scales between supraorbital semicircles and interparietal, 2/2 supraorbitals in contact with interparietal, scales in lateral contact with postfrontals indeterminate, 21 fourth toe lamellae, 1 median head scale, "preoccipital" absent, 5 postmentals.

The series of 28 *A. d. favillarum* has the following counts: snout scales 3 to 6 (mode 4), loreal rows 4 to 6 (mode 4); supraor-

bital semicircles in contact in all specimens; modally 1/1 scales between supraorbital semicircles and interparietal and 0/0 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 16 to 22 (mode 19); median azygous head scales 1 to 6 (mode 4, mean 3.8); "preoccipital" usually present (26 of 28 specimens); postmentals 4 to 8 (mode 7, mean 6.1).

In having an orange dewlap, *favillarum* differs from the subspecies *distichus*, *ocior*, *dominicensis*, *properus*, *sejunctus*, and *ravitergum*. Although in dewlap color *A. d. favillarum* resembles *biminiensis*, *distichoides*, *dapsilis*, *ignigularis*, and *tostus*, none of these races is deep bright green above with rusty temples and a distinct yellow-green parietal. Despite the dewlap similarities, for instance, it is hard to visualize two subspecies more distinct in general appearance than *favillarum* and *tostus*, or *favillarum* and *bimincensis*. In having 1/1 scales between the semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, *favillarum* resembles *distichoides*, *dominicensis*, and *sejunctus*. The moderate mean of median head scales (3.8) in *favillarum* is lower than those of the other orange-dewlapped races (5.0 to 8.7) with the exception of *ignigularis* (3.5).

In some ways *favillarum* most closely resembles *ignigularis*, but these two subspecies can be differentiated in that *favillarum* lacks the bicolor dorsum of *ignigularis*, and *ignigularis* lacks the rusty temples of *favillarum*. The ranges of the two are separated by some 62 kilometers at their nearest points (and the distance is longer if one considers the intervening coastal embayments and irregularities) as well as by the intervening lowland subspecies *ravitergum* in the Llanos de Azua. *A. d. favillarum* is so distinctive in color and pattern that it really requires little detailed comparison with any other subspecies.

A. d. favillarum presumably comes into contact with *ravitergum* to the north at the base of the Sierra de Baoruco and with

dominicensis to the west in the western portion of the Sierra de Baoruco. The lack of *favillarum* × *ravitergum* intergrades has been explained in the discussion of the latter subspecies. The absence of *favillarum* × *dominicenses* intergrades is doubtless due to the fact that there is no material available from the central (and virtually inaccessible) portion of the Sierra de Baoruco. *A. distichus* from the Sierra de Baoruco along the Dominico-Haitian border are *dominicensis*. One of the paratypes of *A. d. favillarum* is of possible interest insofar as the problem of intergradation between this subspecies and *ravitergum* is concerned. This adult lizard, from 24 km SW Barahona at an elevation of 3700 feet (1129 meters), was noted as having a plain yellow dewlap. The specimen might be interpreted as showing tendencies toward the *ravitergum* dewlap condition; on the other hand, this seems unlikely, especially in view of the extreme elevation of the locality. I consider it more likely that it is simply a *favillarum* with an aberrantly colored dewlap.

A. d. favillarum is essentially a denizen of mesic woods and *cafetales* at higher elevations in the Sierra de Baoruco; the known altitudinal limits for the subspecies are from 2300 feet (702 meters) to 3700 feet (1129 meters), although the subspecies must occur at both higher and somewhat lower elevations in this mountain range. In the area of syntopy with *A. brevirostris* (the lower altitudinal limits noted above), the vegetational cover is transitional between that of the very mesic uplands and that of the Valle de Neiba below.

*Anolis distichus aurifer*¹⁰ subsp. n.

Holotype: MCZ 81135, an adult male, from 11 km N Cavaillon, 1300 feet (397 meters), Dépt. du Sud, Haiti, one of a series taken 6 August 1962 by Dennis R. Paulson, David C. Leber, and native collectors. Original number X3717.

Paratypes (all from Dépt. du Sud, Haiti): ASFS X3658-63, ASFS X3680-84, ASFS X3718-23, AMNH 96484-87, KU 93365-68, CM 40613-16, UIMNH 61686-89, same data as holotype; MCZ 74838-64, Pourcine, Massif de la Hotte, 31 December 1962—2 January 1963, F. Vuilleumier; MCZ 74833-37, Trou Bois on Jérémie Road, 30 December 1962, D. Hill.

Referred specimens: HAITI. Dépt. du Sud: Tosia, 1 (MCZ 69756); nr. Massif de la Hotte (= Pic Macaya), 3 (MCZ 38254-56); Petit Trou de Nippes, 8 (USNM 80801-08).

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 54 mm, females to 46 mm snout-vent length), dorsum heavily marbled with varying shades of greens and browns, dewlap vivid orange with a narrow yellow border, modally 1/1 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and a moderate mean number (3.7) of median azygous head scales.

Distribution: Known definitely from only three localities (the type locality, Pourcine, and Trou Bois) on the north and south flanks of the Massif de la Hotte on the Tiburon Peninsula in southwestern Haiti; by inference and observation (see below) assumed to occur from southeast of Jérémie east to the vicinity of Saint Michel du Sud, where *aurifer* intergrades with *dominicensis* (Fig. 3).

Comments: The Tiburon Peninsula of Haiti, west of about the longitude of Miragoâne on the north coast and a presently unknown locality on the south coast, is inhabited by a complex of (at least) three subspecies of *A. distichus*. In addition to these three mainland races, there are additional subspecies on Ile-à-Vache off the south coast and Ile Grande Cayemite off the north coast. The three mainland subspecies are very different in dewlap color in life, but the dewlap colors and

¹⁰ From Latin, *aurifer*, gold bearing.

pattern are of course fugitive in preserved material. Consequently, the precise boundaries of the various races can be defined only in terms of freshly collected specimens, and many older specimens from this region may be placed with a particular subspecies only if there are adequate field data on color in life—which in some critical material there are not. Questionable subspecific assignments will be noted in appropriate discussions.

The series of *A. d. aurifer* from the type locality was examined by me in life. These lizards were heavily mottled and streaked above with varying shades of greens and browns, but lacked any bright colors (i.e., rusty temples) on the head or body. The dewlap was vivid orange with a narrow yellow margin (Pl. II); some males had the dewlap orange-red, a still more distinctive and vivid color. The series from Pourcine in the Museum of Comparative Zoology was noted by the collector to have the dewlaps orange "with yellow spots in the orange"—this latter a feature not seen in the topotypical series. The Trou Bois lizards were likewise noted to have "brilliant orange-red" throats. Richard Thomas collected a single male *A. distichus* about 7.5 km (airline) south-southeast of Roseaux which also had an orange dewlap, but the lizard escaped. These localities summarize the *known* distribution of orange-dewlapped *A. distichus* in this region. I have included the single lizard from Tosia, three from Pic Macaya, and eight from Petit Trou de Nippes with *aurifer* on the basis of provenance. Tosia is on the Les Cayes-Jérémie road on the north side of the Massif de la Hotte, and the lizard might be assigned to the Les Cayes-Camp Perrin subspecies described below. However, there are no known specimens of the more southern race from the north slope of the La Hotte, and it seems likely that the specimen is an *aurifer*. The same comments apply equally well to the Pic Macaya lizards. The series from Petit Trou de Nippes falls into the same category, since

there are no fresh specimens from the northern coast of the Tiburon Peninsula in this region.

The measurements and counts of the holotype of *A. d. aurifer* are: snout-vent length 52 mm, tail ca. 70 mm; 6 scales across snout, 5 loreal rows, semicircles in contact, 1/1 scales between supraorbital semicircles and interparietal, 0/0 supraorbitals in contact with interparietal, 2/2 scales in lateral contact with postfrontals, 20 fourth toe lamellae, 4 median head scales, "preoccipital" present, 6 postmentals.

The series of 67 *A. d. aurifer* has the following counts: snout scales 4 to 7 (mode 4), loreal rows 3 to 6 (mode 4); supraorbital semicircles in contact in all specimens; modally 1/1 scales between supraorbital semicircles and interparietal and 0/0 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 16 to 23 (mode 19, but 20 has almost the same frequency); median azygous head scales 1 to 7 (mode 3, mean 3.7); "preoccipital" always present; postmentals 4 to 10 (mode 7, mean 7.2).

The orange dewlap of *A. d. aurifer* differentiates the subspecies from the yellow-dewlapped races *distichus*, *ocior*, *dominicensis*, *properus*, *sejunctus*, and *ravitergum*. In addition to dewlap and dorsal color and pattern (none of the above subspecies has a heavily mottled green-and-brown back), *aurifer* differs in the high mean number of postmentals (7.2 in *aurifer*, 5.4 to 6.7 in the above races, with *ocior* approaching *aurifer* most closely). The other orange-dewlapped subspecies are *bininiensis*, *distichoides*, *dapsilis*, *ignigularis*, *tostus*, and *favillarum*, of which *aurifer* is closest geographically to *favillarum*, but from which it is separated by the intervening range of *dominicensis*. All these subspecies differ in dorsal pattern and color from *aurifer* (in fact, only *favillarum* has a green phase); the rusty temples of *favillarum* additionally distinguish it from *aurifer*. The mean postmentals of *aurifer*

(7.2) aid in separating it from the other orange-dewlapped subspecies (3.7 to 6.1, with *favillarum* approaching *aurifer* most closely).

A. d. aurifer is presumed to intergrade with *A. d. dominicensis* in the vicinity of Saint Michel du Sud, southwest of Miragoâne. A series of 18 specimens (ASFS X3830-47) from 3.5 mi. SW Saint Michel du Sud, 1000 feet (305 meters), was noted as having the dewlaps pale orange with a yellow edge—precisely the condition expected at the place of intergradation of an orange-dewlapped and a yellow-dewlapped race. Purely on the basis of provenance, I consider two other lots of specimens from this same region (MCZ 66113-32, Fond des Nègres, and MCZ 25504-08, 10 mi. [16.0 km] SW Miragoâne) *aurifer* × *dominicensis*. The latter lot may be assignable to *A. d. dominicensis*, but the Fond des Nègres series is close to Saint Michel du Sud, the known locality for *aurifer* × *dominicensis* intergradation. Other than these intergrades, the eastern limits of *aurifer* are unknown; specimens from the north coast in the Miragoâne region were clearly *dominicensis* in life.

In the northwest *aurifer* intergrades with the yellow-dewlapped population on the tip of the Tiburon Peninsula in the area about Roseaux, and in the south *aurifer* intergrades with another subspecies in the vicinity of Cavaillon. In both cases, these intergrades will be discussed with their respective subspecies.

The distribution herein attributed to *A. d. aurifer* is indeed most peculiar, since it is assumed to occur on both sides of at least the eastern portion of the Massif de la Hotte, and along a portion of the north coast as well. Much of the upland range assigned to *aurifer* is extremely difficult to penetrate, and it may be some time before the details of the distribution of *aurifer* are clarified. On the basis of the few annotated series presently available, there is no choice but to regard all these specimens as one subspecies.

The type locality of *A. d. aurifer* is a rocky shaded hillside on the southern slopes of the Massif de la Hotte.

*Anolis distichus vinosus*¹¹ subsp. n.

Holotype: MCZ 81136, an adult male, from Camp Perrin, Dépt. du Sud, Haiti, one of a series taken 22 July 1962 by native collectors. Original number X2711.

Paratypes (all from Dépt. du Sud, Haiti): ASFS X2533-49, ASFS X2560-70, AMNH 96488-97, UIMNH 61690-95, CM 40617-22, UF/FSM 21518-23, same data as holotype; MCZ 63125-31, Camp Perrin, 5 August 1960, A. S. Rand and J. D. Lazell, Jr.; ASFS X3361-62, Les Cayes, 2 August 1962, D. R. Paulson; MCZ 63111-17, Les Cayes, 3 August 1960, A. S. Rand and J. D. Lazell, Jr.; ASFS X3353-55, 9.9 km ENE Port-Salut, 650 feet (198 meters), 3 August 1962, D. C. Leber, D. R. Paulson; ANSP 27156-62, KU 93369-75, USNM 157926-27, Carrefour Canon, 500 feet (153 meters), 1 August 1962, R. F. Klinikowski, A. Schwartz; MCZ 63118-21, Carrefour Canon, 4-5 August 1960, A. S. Rand and J. D. Lazell, Jr.; MCZ 63122-24, Les Platons, above Carrefour Canon, 5 August 1960, A. S. Rand and J. D. Lazell, Jr.

Referred specimens: HAITI. Dépt. du Sud: Tombeau Cheval, 3 (MCZ 63132-34).

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 54 mm, females to 45 mm snout-vent length), dorsum marbled with greens and browns of varying shades, dewlap with a rather restricted basal maroon (wine colored) blotch or spot and a broad pale yellow margin, modally 1/1 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with interparietal, 2/2 scales in contact laterally with the postfrontals, and a low mean number (3.4) of median azygous head scales.

Distribution: The southern slopes of the Massif de la Hotte from Camp Perrin (and

¹¹ From Latin, *vinosus*, full of wine.

Tombeau Cheval?) and Les Platons, south to Les Cayes, and west onto the Presqu'île du Port-Salut; intergrades with *A. d. aurifer* at Cavaillon (Fig. 3).

Comments: The holotype of *A. d. vinosus* has the following measurements and counts: snout-vent length 53 mm, tail 35 mm, broken; 5 scales across snout, 5 loreal rows, semicircles in contact, 1/1 scales between supraorbital semicircles and interparietal, 0/0 supraorbitals in contact with interparietal, 2/2 scales in lateral contact with postfrontals, 20 fourth toe lamellae, 4 median head scales, "preoccipital" present, 6 postmentals.

The series of 102 *A. d. vinosus* has the following counts: snout scales 4 to 8 (mode 4), loreal rows 4 to 6 (mode 5); supraocular semicircles in contact in all specimens; modally 1/1 scales between supraorbital semicircles and interparietal and 0/0 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 16 to 24 (mode 20); median zygous head scales 2 to 8 (mode 3, mean 3.4); "preoccipital" always present; postmentals 4 to 11 (mode 7, mean 7.4).

Compared with all other subspecies of *A. distichus*, from both the Hispaniolan mainland and the Bahamas, none is so easily differentiable as *vinosus*. The combination of maroon or wine-red centered dewlap with a broad yellow margin (Pl. II) and heavily mottled brown and green dorsum will distinguish it from any other subspecies. Only *A. d. juliae* on Ile-à-Vache resembles *A. d. vinosus* in dewlap color and pattern; *juliae* will be discussed further below. The amount of maroon in the basal spot of the *vinosus* dewlap is variable, and the illustrated individual (which is the holotype) resembles the maximal condition. The range of *vinosus* is bordered on the east by the orange-dewlapped *aurifer* and on the northwest by a yellow-dewlapped subspecies. In both cases, the contrast between the *vinosus* dewlap and that of its neighbors is striking, and the races are

easily separable. In dorsal coloration, *vinosus* is most like *aurifer*, with a marbled or mottled pattern of browns and greens. As far as scales are concerned, there is nothing distinctive about *vinosus*; along with the Hispaniolan subspecies *dominicensis*, *sejunctus*, *favillarum*, and *aurifer*, *vinosus* has 1/1 scales between the supraorbitals and the interparietals and 0/0 supraorbitals touching the interparietal. With a mean of 3.4 median head scales, *vinosus* ranks low among all subspecies, and with a mean of 7.4 postmentals, it ranks among the highest.

A. d. vinosus is extremely common throughout its range and especially so at Camp Perrin, where it was observed and taken on trees and hedgerows along dirt roads. At Carrefour Canon, these lizards were abundant in a *cafetal* with cacao, shaded by a high canopy. In Les Cayes, *A. d. vinosus* was abundant about walls and buildings, trees and gardens, etc.

Intergrades between *vinosus* and the race to the northwest will be discussed later. Intergrades between *vinosus* and *aurifer* are represented by a series of three specimens from Cavaillon (ASF5 X3729-31). The two males in this short series had dewlaps which had the basal maroon spot paler (more reddish-orange) than in *vinosus*, and the broad margin of the dewlap distinctly more orange—a combination which I interpret as demonstrating intergradation between the two subspecies. These Cavaillon specimens were collected on the same day as the toptotypical series of *aurifer*, and direct comparisons of the intensities of the dewlap colors in both lots were made directly with one another.

I have associated the three specimens from Tombeau Cheval (MCZ 63132-34) with *vinosus* rather than *aurifer* or the race to the northwest on the basis of provenance. Tombeau Cheval lies on about the high point of the road between Les Cayes and Jérémie, and just north of Camp Perrin. Since Tombeau Cheval is closer to Camp Perrin than to any other locality whence

A. distichus is known in this region, I have considered the specimens from that locality as *vinosus*, although I admit the possibility of error in such an assignment in this particular region.

Anolis distichus juliae Cochran

Anolis dominicensis juliae Cochran, 1934, Occ. Papers Boston Soc. Nat. Hist., 8:169.

Type locality: Ile-à-Vache, Haiti.

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 53 mm, females to 44 mm snout-vent length), dorsum brownish-gray to green, somewhat marbled with darker browns and greens, dewlap almost completely dark wine-red with a pale yellow margin, modally 0/0 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and a low mean number (3.4) of median azygous head scales.

Distribution: Ile-à-Vache, Haiti (Fig. 3).

Comments: *A. d. juliae* is obviously an insular derivative of the mainland *A. d. vinosus*, which it resembles in general dewlap pigmentation. Four characters separate the two subspecies: 1) the wine-red pigment in the dewlap of *juliae* is brighter (more red) than that of *vinosus*. 2) the extent of the wine-red spot is greater in *juliae* than in *vinosus* (Pl. II), 3) the dorsum of *juliae* is generally paler and less marbled and dark than that of *vinosus*, and 4) the modal condition of 0/0 scales between the semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal differ from the 1/1 and 0/0 (respectively) modes in *vinosus*. Comparisons with the remaining races are unnecessary, since no subspecies, other than *vinosus*, has the red-blotched dewlap of *juliae*.

Measurements and scale counts of the holotype (a male) of *A. d. juliae* are: snout-vent length 47 mm, tail ca. 49 mm, broken; 4 scales across snout, 5 loreal rows,

semicircles in contact, 1/0 scales between supraorbital semicircles and interparietal, 0/1 supraorbitals in contact with interparietal, 3/2 scales in lateral contact with postfrontals, 2/1 fourth toe lamellae, 4 median azygous head scales, "preoccipital" present, 8 postmentals.

Scale counts on the series of 31 *A. d. juliae* are: snout scales 4 to 8 (mode 4), loreal rows 4 to 6 (mode 5); supraorbital semicircles always in contact; modally 0/0 scales between the semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal; fourth toe lamellae 16 to 22 (mode 20); median azygous head scales 2 to 6 (mode 4, mean 3.4); "preoccipital" usually present (29 of 30 lizards); postmentals 5 to 9 (mode 8, but 6 has almost as high a frequency, mean 7.2).

Where we collected on the western end of Ile-à-Vache, *A. d. juliae* was moderately common, occurring about houses and on trees in cultivated areas, as well as on *Cocos* trunks in old coconut plantings.

Specimens examined: HAITI. Ile-à-Vache: no other locality, 9 (MCZ 37517—holotype, MCZ 37518–19—paratypes, MCZ 6171, MCZ 86767–71); western end, 22 (ASFS X3516–36, ASFS X3548).

*Anolis distichus suppar*¹² subsp. n.

Holotype: MCZ 81137, an adult male, from Dame-Marie, south side of town along coast, Dépt. du Sud, Haiti, taken 13 March 1966 by Richard Thomas. Original number V9236.

Paratypes (all from Dépt. du Sud, Haiti): ASFS V9237, same data as holotype; ASFS V9268, ca. 5 km (airline) S Dame-Marie, 13 March 1966, R. Thomas; ASFS V9269, ca. 10 km (airline) WSW Moron, 13 March 1966, R. Thomas; ASFS V9192–94, ASFS V9213, ca. 7.5 km (airline) WSW Moron, 13 March 1966, E. Cyphale, R. Thomas; MCZ 74766, MCZ 74768–810, MCZ 74812–25, Marfranc, 26–27 December 1962, D. Hill and F. Vuillemier; USNM 160682–86,

¹² From Latin, *suppar*, almost equal.

Jérémie, 9–10 March 1966, R. Thomas, native collectors; UF/FSM 21524–25, Jérémie, 11 March 1966, R. Thomas; AMNH 96501–04, Jérémie, 11 March 1966, R. Thomas, native collector; MCZ 63106, Jérémie, 31 July 1960, A. S. Rand and J. D. Lazell, Jr.; MCZ 3346, MCZ 86772–77, Jérémie, no date, D. F. Weinland; KU 93376–79, 2 km NW Jérémie, 14 March 1966, native collector; MCZ 69766–79, Carrefour Sanon, nr. Jérémie, December 1962, G. Whiteman; MCZ 69780–91, Place Nègre, nr. Jérémie, December 1962, G. Whiteman; CM 37811 + 10 untagged specimens, Place Nègre, nr. Jérémie, 10–11 December 1961, L. Whiteman; MCZ 69792–809, Mayette, nr. Jérémie, December 1962, G. Whiteman; MCZ 64630–37, Tiga, nr. Jérémie, 15 December 1960, G. and L. Whiteman; MCZ 69751, Lancenise, nr. Jérémie (not mapped), December 1962, G. Whiteman; MCZ 69757–65, La Source, nr. Jérémie (not mapped), December 1962, G. Whiteman; MCZ 69754–55, Perine, nr. Jérémie (not mapped), December 1962, G. Whiteman; MCZ 65627–28, nr. Jérémie, 1960, L. and G. Whiteman; MCZ 69752–53, Bozo, nr. Jérémie (not mapped), December 1962, G. Whiteman; ASFS V9359–60, ca. 8 km (airline) S Marché Leon, 3000 feet (915 meters), 15 March 1966, native collector.

Referred specimens: HAITI. *Dépt du Sud:* Tiburon, 6 (MCZ 6170, MCZ 86778–82); Paroty, nr. Jérémie (not mapped), 1 (MCZ 64638); Place Nègre, nr. Jérémie, 39 (MCZ 64675–713); nr. Jérémie, 7 (MCZ 3346).

Definition: A subspecies of *A. distichus* characterized by moderate size (males to 54 mm, females to 44 mm snout-vent length), dorsum pale green, somewhat marbled with gray and yellow, dewlap pale yellow to yellow-green or grayish yellow and at times with a dull yellow-orange basal smudge, modally 1/1 scales between the supraorbital semicircles and the interparietal and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and

a low mean number (3.4) of median azygous head scales.

Distribution: The extreme western tip of the Tiburon Peninsula in Haiti, from Dame-Marie east to Jérémie, and south on the northern slopes of the Massif de la Hotte in the vicinity of Marché Leon; occurrence at Tiburon problematical (see below) (Fig. 3).

Comments: The terminal subspecies on the western tip of the Tiburon Peninsula is remarkably different from its neighbors to the east (*aurifer*) and south (*vinosus*) and in fact resembles its relative *dominicensis* far to the east, both in dorsal color and dewlap color. In having a yellow dewlap (Pl. II), *suppar* is readily distinguishable from *aurifer* (orange dewlap) and *vinosus* (maroon-centered dewlap). The resemblances to *dominicensis* are strong, including a dorsal green color, a pale yellow dewlap, comparable means of median head scales (3.4 and 3.9), and 1/1 scales between semicircles and interparietal and 0/0 supraorbitals in contact with interparietal. The major differences are the higher mean number of postmentals (7.9 in *suppar*—the highest mean of any subspecies—and 6.6 in *dominicensis*) and the more pastel or paler green dorsum.

The measurements and counts for the holotype of *A. d. suppar* are: snout-vent length 52 mm, tail 65 mm; 5 scales across snout, 5 loreal rows, semicircles in contact, 1/1 scales between supraorbital semicircles and interparietal, 0/0 supraorbitals in contact with interparietal, 2/2 scales in lateral contact with postfrontals, 22 fourth toe lamellae, 4 median head scales, "preoccipital" present, 7 postmentals.

Scale counts for the series of 176 *A. d. suppar* are: snout scales 4 to 8 (mode 4), loreal rows 3 to 6 (mode 5); modally 1/1 scales between supraorbital semicircles and interparietal and 0/0 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 16 to 25 (mode 18 and 19); median azygous head scales 1 to 7 (mode 3, mean

3.4); "preoccipital" usually present (170 of 176 lizards); postmentals 4 to 13 (mode 7, mean 7.9).

The dewlaps of *A. d. suppar* have been noted in life as pale yellow-green (Jérémie, Dame-Marie, and west-southwest of Moron) and pale yellow (Marché Leon; pl. 17 E 1, west-southwest of Moron). A male from the Moron region also has a dull yellow-orange (pl. 9 J 10) basal smudge. The dorsum is usually pale or pastel green, somewhat overlaid with grayish marbling and/or streaking, and commonly there are yellow or paler green middorsal blotches, especially on the anterior trunk and neck. Preserved specimens, regardless of freshness of preservation, very regularly show both a broad dark (black) V-shaped collar which arises from about the angle of the jaws and extends across the neck, and a large dark (black) area on the upper side of the head, separated from the collar by a narrow paler (gray) V-shaped band. Since no note of these markings was made in life, they must not be conspicuous in the living animal, but they are remarkably consistent in the preserved lizards. I do not know if *suppar* is capable of a brown phase.

Comparisons of *suppar* with the adjacent *aurifer* and *vinosus* were made above. From the orange-dewlapped subspecies *biminiensis*, *distichoïdes*, *dapsilis*, *ignigularis*, *tostus*, and *favillarum*, *suppar* differs in having a yellow dewlap. From *juliae*, *suppar* also differs in having a yellow dewlap instead of a dewlap with an extensive wine-colored basal blotch. From the yellow-dewlapped races (*distichus*, *ocior*, *properus*, *sejunctus*, and *ravitergum*; comparison with *dominicensis* was made above) *suppar* differs in being (always?) green (in contrast to *distichus*, *properus*, *sejunctus*, and *ravitergum*) and in lacking the lateral pale line of *ocior* (although many *suppar* have the flank stripe fairly well developed, it is not clearly outlined above and below by darker). Other differences from *ocior* include a much lower mean number of

median head scales (3.4 versus 5.8), 1/1 scales between the semicircles and the interparietal (0/0 in *ocior*), and 0/0 supra-orbitals in contact with the interparietal (1/1 in *ocior*).

The specimens from Tiburon were collected by Garman and thus are quite old and faded, and there are no color data on them. I consider them *suppar* only provisionally; Tiburon is 28 kilometers airline south of Dame-Marie, but it may be precisely in this intervening region that *suppar* intergrades with *vinosus*. The Tiburon lizards may be *vinosus*; there are no specimens from any locality between Dame-Marie and Tiburon, on the one hand, or between Tiburon and Port-Salut, on the other.

Although there is no evidence of intergradation between *suppar* and *vinosus*, there is evidence of intergradation between *suppar* and *aurifer*. A series (MCZ 74826-32) from Roseaux was noted as having the dewlap with a "deep orange rust spot at base." It may be recalled that there is a sight record of an *aurifer* from 7.5 km (airline) south-southeast of Roseaux. The zone of intergradation between *suppar* and *aurifer* appears to be very narrow, centering in the region about Roseaux.

A. d. suppar is quite common throughout most of its range, occurring from sea level to elevations of 3000 feet (915 meters) above Marché Leon on the northern slopes of the Massif de la Hotte. In habitat, it does not differ from other altitudinally wide-ranging races, in that it was taken in edificarian situations, along the southern slopes of the Monts Cartaches, and in both natural and artificial wooded situations which the species inhabits throughout its range.

*Anolis distichus patruelis*¹³ subsp. n.

Holotype: MCZ 81138, an adult male, from vicinity of Pointe Sable, Ile Grande

¹³ From Latin, *patruelis*, relating to a cousin.

Cayemite, one of a series taken 18 March 1966 by Richard Thomas and native collectors. Original number V9409.

Paratypes: ASFS V9410-14, ASFS V9423-26, MCZ 81142-46, USNM 160687-91, AMNH 96505-08, same data as holotype; MCZ 25519, Grande Cayemite, 3 August 1927, W. J. Eyerdam.

Definition: A subspecies of *A. distichus* characterized by small size (males to 50 mm, females to 42 mm snout-vent length), dorsum green to gray, usually not prominently striate, dewlap solid dark reddish to mustard orange, modally 1/1 scales between the supraorbital semicircles and the interparietals and 0/0 supraorbitals in contact with the interparietal, 2/2 scales in contact laterally with the postfrontals, and a moderate mean number (4.6) of median azygous head scales.

Distribution: Ile Grande Cayemite, Haiti (Fig. 3).

Comments: The measurements and scale counts for the holotype of *A. d. patruelis* are: snout-vent length 49 mm, tail ca. 60 mm; 4 scales across snout, 4 loreal rows, semicircles in contact, 1/1 scales between supraorbital semicircles and interparietal, 0/0 supraorbitals in contact with interparietal, 2/2 scales in lateral contact with postfrontals, 19 fourth toe lamellae, 2 median head scales, "preoccipital" present, 8 postmentals.

The series of 25 *A. d. patruelis* has the following counts: snout scales 4 to 8 (mode 4), loreal rows 4 to 6 (mode 4); modally 1/1 scales between supraorbital semicircles and interparietal and 0/0 supraorbitals in contact with interparietal; 2/2 scales in lateral contact with postfrontals; fourth toe lamellae 16 to 22 (mode 20); median azygous head scales 2 to 7 (mode 4, mean 4.6); "preoccipital" always present; postmentals 6 to 11 (mode 8, mean 7.8).

The dorsum of *A. d. patruelis* varies between green and gray; most specimens show little or no striae, but others have a lineate dorsum. The dewlap varies in life from dark reddish to mustard orange (pl.

6 K 9, pl. 5 L 11), and has an orange (rather than pale yellow) margin (Pl. II).

Ile Grande Cayemite is adjacent to the northern section of the presumed mainland range of *A. d. aurifer*, and *A. d. patruelis* resembles the former subspecies in dewlap color. A major difference is the absence in *patruelis* of the narrow yellow dewlap margin which occurs in *aurifer*; the richer and deeper hues of the *patruelis* dewlap are likewise different than the brighter pigments of *aurifer*. The back of *aurifer* is heavily marbled and mottled with greens and browns, whereas that of *patruelis* is generally much plainer, lacking pronounced mottling, and is rarely clearly striate.

A. d. patruelis, with its deep orange dewlap, differs from the subspecies which have yellow dewlaps (*distichus*, *ocior*, *dominicensis*, *properus*, *sejunctus*, *ravitergum*, and *suppar*) and those which have a maroon or wine-red basal spot (*vinosus*, *juliae*). The other orange-dewlapped subspecies are *biminiensis*, *distichoides*, *dapsilis*, *ignigularis*, *tostus*, *favillarum* (and *aurifer*, with which *patruelis* was compared above). Aside from the differences in dorsal pigmentation and pattern, the deeper hue of the dewlap color, and the absence of a yellow dewlap margin in *patruelis*, the Grande Cayemite subspecies differs from all other orange-dewlapped forms in having a very high mean of postmentals (7.8 in *patruelis*, 3.7 to 7.2 in other orange-throated subspecies, with *aurifer* having the highest mean). In fact, other than *suppar*, *patruelis* has a higher postmental mean than all other subspecies.

Most of the paratype series were native collected; the lizards came from dry scrubby woods growing on almost bare limestone and from about the village at Pointe Sable.

There is a short series (USNM 80814-18) of *A. distichus* from Ile Petite Cayemite, just to the west of Grande Cayemite. These specimens have long been in preservative, and consequently no details of coloration or pattern are discernible. They may be

patruelis, although, as pointed out for *Ameiva taeniura* Cope, which is known from both the Cayemites, there is a possibility that each island has its own subspecies (Schwartz, 1967a). In this short Petite Cayemite series of five specimens, the postmentals range between 4 and 7 (two specimens have counts of 4 and 5, and are thus lower than the much longer series from Grande Cayemite). One lizard (USNM 80818) has only a single median azygous head scale, the "preoccipital," a condition not observed in the Grande Cayemite series. I consider the Petite Cayemite lizards *A. d. patruelis* only provisionally.

THE FLORIDA POPULATIONS

Anolis distichus was first reported from the continental United States by Smith and McCauley (1948), who described *A. d. floridanus* on the basis of a short series of six specimens from Brickell Park in downtown Miami, Florida. The status of the mainland lizards was later discussed by Duellman and Schwartz (1958:279-281), who regarded *floridanus* as a synonym of *A. d. distichus*. Of the four scale characters and one pigmental trait, these authors noted that "*floridanus*" (of which form they examined 77 specimens in detail) agreed with toptotypical *distichus* in number of infraorbital scales, number of scales bordering the median suture (= median azygous head scales), and in having the throat unpigmented, but disagreed with the nominate subspecies in having a higher percentage (63.6 per cent versus 14.0 per cent) of specimens with the supraocular semicircles separated and in the modal number of scales separating the prefrontal from the anterior supraocular (mode 1 and 2 with almost equal frequencies in "*floridanus*," mode 2 in toptotypical *distichus*). With increased knowledge of *Anolis distichus* in its insular range, it is appropriate to reassess the status not only of "*floridanus*" but also that of another mainland Floridian population.

Through the efforts of C. Rhea Warren, I have been able to examine a short series of seven lizards (RT 1478-84) from Northwest South River Drive in Miami, Florida. These lizards were green in life and capable of becoming solid brown; they represent a small sample from a large and very successful colony centering near the junction of the Miami Canal (the northwestern extension of the Miami River) and the artificial Tamiami Canal. The specimens are typical in all ways of *A. d. dominicensis*, with the possible exception of three of the seven specimens having 3/3 scales in lateral contact with the postfrontals. This high frequency is doubtless due to the small sample size; in the series of 245 *A. d. dominicensis* from Hispaniola, 32 have 3/3 scales in lateral contact with the postfrontals, whereas 162 have 2/2 scales in this position. The yellow dewlaps with occasional orange basal blush and the green dorsa agree in detail with my concepts of *A. d. dominicensis*, and I assume that these lizards have been recently introduced into this region through some fluke of international shipping. King and Krakauer (1966:146) have reported this population as *A. d. dominicensis* at my suggestion.

Anolis distichus floridanus Smith and McCauley

Anolis distichus floridanus Smith and McCauley, 1948, Proc. Biol. Soc. Washington, 61:160.

Type locality: Brickell Park, Miami, Dade County, Florida.

Definition: A subspecies of *A. distichus* characterized by small size (males to 50 mm, females to 45 mm snout-vent length), dorsum gray to dark brown and without a green phase, dewlap pale yellow (occasionally pale orange), modally 1/1 scales between the supraorbital semicircles and interparietal, 0/0 supraorbitals in contact with the interparietal, 2/3 scales in contact laterally with the postfrontal, and very high mean number (7.9) of median azygous head scales correlated with the very high incidence (about 60 per cent) of complete

separation of supraocular semicircles medially.

Distribution: Known only from the extreme eastern coastal and near-coastal margin of Dade County, Florida (Fig. 2).

Comments: I have examined 90 *A. distichus* (aside from the *A. d. dominicensis* noted above) from southern Florida. Although Duellman and Schwartz (1958: 279-281) considered *A. d. floridanus* synonymous with *A. d. distichus* from New Providence, the above definition clearly shows that *floridanus* differs from *distichus* in several characters which elsewhere in the Bahamas and Hispaniola I regard as indicative of subspecificity. The use of the name *A. d. floridanus* for the continental lizards mainly involves the philosophical problem of its appropriateness if the mainland *A. distichus* have been introduced only recently by man. This question is discussed below.

The two major samples which I have studied come from two localities (Brickell Park and its vicinity in downtown Miami, and Fairchild Tropical Garden). Mr. Warren advises me that *A. distichus* occurs elsewhere in Miami and in Coral Gables, Florida, and Wayne King (*in litt.*, 28 September 1966) reported its occurrence at one additional locality in Miami, four in Coral Gables, three in Coconut Grove, and one in Kendall. I have not examined material from any of these localities. Dr. King suggests that the Brickell Park-Fairchild Garden population is continuous (the Coconut Grove localities and a locality at the junction of Brickell Avenue and the Rickenbacker Causeway in downtown Miami fill in fairly well the hiatus between the two presumed terminal stations for *A. d. floridanus*), and I concur. King and Krakauer (1966:146) stated that all other localities are the result of secondary introductions by reptile fanciers; a second method for dispersal may be that Fairchild Garden supplies plants for ornamental purposes to Dade County and to private persons for decorative planting, with re-

sultant accidental distribution of *A. floridanus* throughout the county.

The two terminal localities are distant about 8.5 miles (13.6 km) from one another. Both are more or less coastal, and Fairchild Tropical Garden has for many years been a center to which plants from outside the United States have been introduced for purposes of culture and exhibit. The Brickell Park locality lies in downtown Miami on the coast on the south side of the Miami River. The lizards are extremely abundant at both localities. In most characters the two samples are alike, and if they represent two different "introductions," their later convergence has been along remarkably similar lines.

The largest mainland male and female are both from Brickell Park (snout-vent length 50 mm in the male, 45 mm in the female), whereas the largest of each sex from Fairchild Garden are 47 mm and 39 mm. The scale characters of the two populations are: snout scales 3 to 6 (mode 6) at Brickell Park, 3 to 7 (mode 6) at Fairchild Garden; loreal rows 4 and 5 (mode 4) at Brickell Park, 4 to 6 (mode 4) at Fairchild Garden; semicircles usually not in contact (27 of 42 lizards from Brickell Park, 25 of 48 lizards from Fairchild Garden); modally 1 1 scales between the supra-orbital semicircles and the interparietal and 0 0 supraorbitals in contact with the interparietal in both samples; fourth toe lamellae 15 to 19 (both localities), modes 17 or 18 (Brickell Park) and 18 or 19 (Fairchild Garden); modally 3 3 scales in lateral contact with postfrontals at Brickell Park, but almost an equal frequency of 2 2 at this locality; modally 2 3 scales in lateral contact with postfrontals at Fairchild Garden; median azygous head scales 5 to 12 (mode 8, mean 8.0) at Brickell Park, 4 to 10 (mode 8, mean 7.8) at Fairchild Garden; "preoccipital" usually present (40 of 42 lizards from Brickell Park, 42 of 48 lizards from Fairchild Garden); postmentals 3 to 6 (mode 4, mean 4.3) at Brickell Park, 3 to 8 (mode 5 or 6, mean

4.4) at Fairchild Garden. The dewlap is pale yellow to yellow with an extensive pale orange blush; dorsally the lizards are gray, incapable of a green phase but capable of becoming dark brown.

The mainland *A. distichus* obviously are related to the Bahaman populations of the species rather than to the Hispaniolan forms. Such features as the high incidence of complete separation of the semicircles, the low number of postmentals, and the lack of a green phase all point to the Bahamas as the place of origin of *A. d. floridanus*. It has generally been assumed that the continental *A. distichus* are the result of a very recent introduction, either fortuitous or intentional, by man from the Bahamas. If such were the case, it should be a simple matter to determine from which of the five Bahaman subspecies *floridanus* has been drawn. This is not the case; *A. d. floridanus* presents a suite of characters which distinguishes it from all Bahaman, as well as Hispaniolan, populations. If the forerunners of *floridanus* were only recently introduced by man, then differentiation in Florida of *floridanus* must have been extremely rapid. If, on the other hand, *A. d. floridanus* has had a history other than that generally accepted—i.e., it has been in Florida for a longer period or *A. d. floridanus* has been introduced only recently but evolved its peculiar characteristics elsewhere—its differences from any other subspecies could be accounted for more readily. Evidence for the relationship and a suggested history of the continental populations are offered below.

Turning first to dorsal and dewlap colors, *floridanus* resembles all the Bahaman subspecies except *ocior* in the former (since *floridanus* lacks a green phase) and only *distichus* in the latter. The scale characters, on the other hand, are distinctive. The very high incidence of complete separation of the semicircles (57.8 per cent if both samples are combined; 64.2 per cent in the Brickell Park sample alone, 52.1 per cent in the Fairchild Garden sample

alone) is much greater than that of any Bahaman subspecies, being approached most closely by *distichoides* (32.1 per cent) and *biminiensis* (30.2 per cent). In modally having 1/1 scales between the semicircles and the interparietal, *floridanus* differs from all Bahaman populations except *distichoides*. New Providence and Exuma Cays *A. d. distichus* do have 1/1 as the modal condition (or as a bimode in the former case), however. Although the modal condition is 2/3 scales in lateral contact with the postfrontals in *floridanus* (30 individuals), 29 lizards have 2/2 scales in lateral contact and 25 have 3/3 (of which 15 are from Brickell Park, where 3/3 is the mode). Such a high incidence of 3/3 scales in lateral contact with the postfrontals is unequalled in any Bahaman population except *biminiensis*, where 3/3 is the mode.

The mean of 7.9 median azygous head scales in *floridanus* is higher than that of any Bahaman subspecies with the exception of 8.7 in *distichoides*. In having 0/0 supraorbitals in contact with the interparietal, *floridanus* is like *distichus*, *distichoides*, and *dapsilis*, but unlike *biminiensis* and *ocior*. The regular occurrence of the "preoccipital" in *floridanus* resembles the condition in all Bahaman subspecies except *distichoides* and *biminiensis* which more often lack the "preoccipital." Finally, the mean of 4.4 postmentals in *floridanus* is lower than those of all Bahaman populations, being most closely approached by *distichoides* (4.6) and *biminiensis* (4.8).

From the above resume, it is apparent that, although *floridanus* agrees with nominate *distichus* in dorsal and dewlap colors, it differs markedly from it in scale characters. The two populations which bear the closest resemblance in scalation to *floridanus* are *distichoides* and *biminiensis*, and, not unexpectedly, these two races are those most geographically adjacent to *floridanus*. The occasional occurrence in *floridanus* of a pale orange dewlap also suggests that one or the other of these